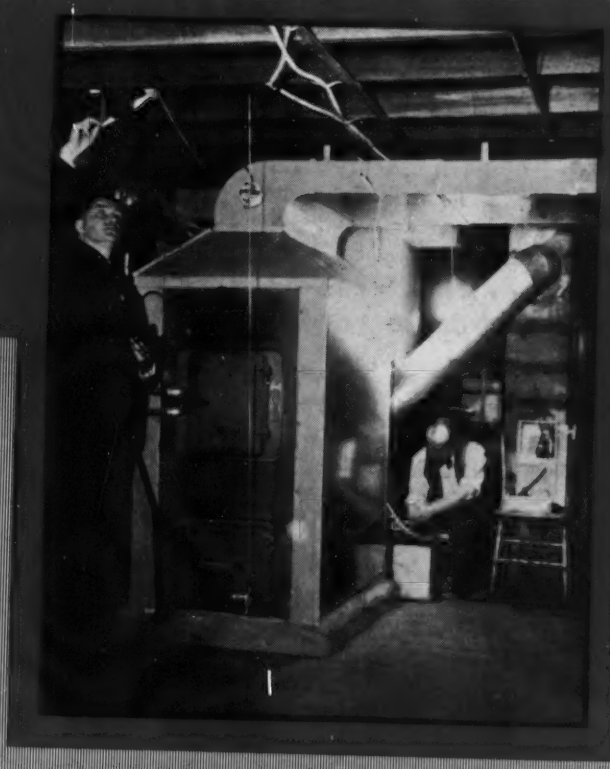
AMERICAN ARTISAN

JULY
1943



RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1880

A 100% RECORD

Awards on May 8th, 1943 to two plants in Kenosha, Wisc., completed this 100% record for The American Brass Company.

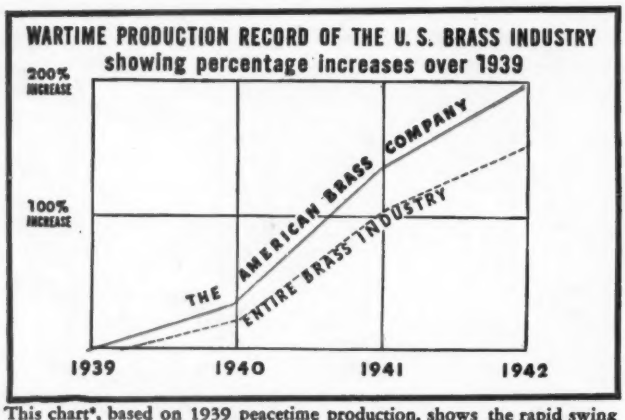
ALL TEN AMERICAN BRASS CO. PLANTS IN U. S. A. HAVE EARNED RIGHT TO FLY ARMY-NAVY "E" FLAGS

This is the story in terms of war production

Our Connecticut plants were among the first in the brass industry to receive the coveted "E" Award for outstanding production of war materials. Since then *all* our plants, including those in the States of Michigan, Wisconsin and New York, have been similarly honored.

As the largest fabricator in the copper and brass field, The American Brass Company is keenly aware of its responsibility and its opportunity to serve the cause of the United Nations.

Since 1939, production has been tripled, with virtually every pound today going for war purposes.



This chart*, based on 1939 peacetime production, shows the rapid swing into all-out war production, both by the copper and brass fabricating industry and The American Brass Company (not including Government-owned plants). All-time production records have been continually broken ever since the National Defense Program was initiated in 1940.

*Based on compilations of The American Bureau of Metal Statistics

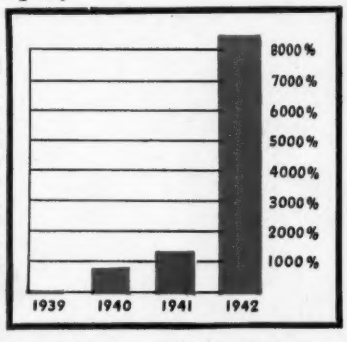
This record was accomplished by close cooperation between management and labor . . . careful planning for rapid conversion to wartime operations . . . intensive training of new personnel . . . plus efficient utilization of existing and new plant equipment.

Detailed figures, of course, cannot be revealed, but The American Brass Company is consistently breaking all previous volume records. In addition to its U. S. plants and that of a Canadian subsidiary, Anaconda American Brass Ltd., the company's production also embraces three plants operated for the United States and Canadian Governments.

Shipments this past January were the largest in the company's history. March exceeded January. The first quarter of '43 was by far the greatest tonnage quarter in the records of the company.

PRODUCTION OF COPPER ALLOYS FOR AMMUNITION by The American Brass Co.

This chart shows the vast increase in production of copper-base alloys directly earmarked for ammunition in plants operated by The American Brass Company. This is one of the most vital needs for copper and brass. Tremendous quantities are required for all types of ammunition.



The American Brass Company is proud indeed that all the plants it operates in the U. S. A. have won the honor of flying the Army-Navy "E" for excellence in production. But it is even prouder of the organization and the will-to-produce that have made this record possible . . . *and will keep it going.*

481840

THE AMERICAN BRASS COMPANY

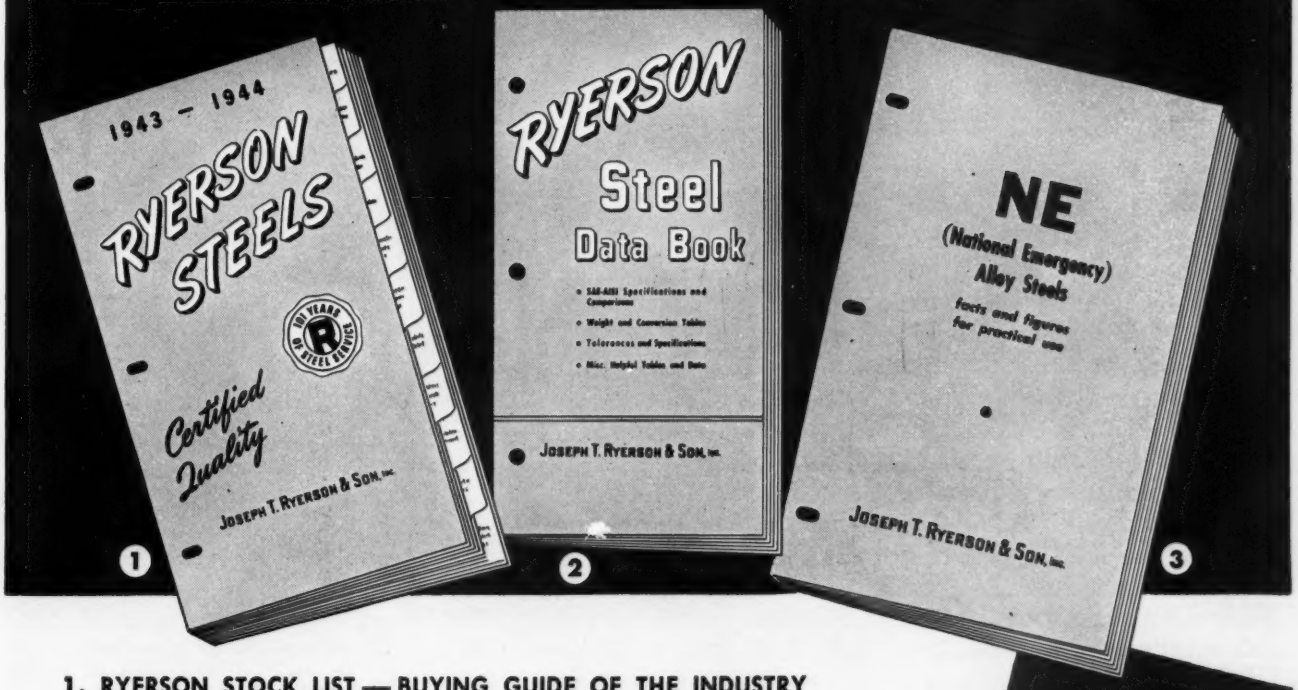
ANACONDA

Subsidiary of *Anaconda Copper Mining Company*

BUY ALL THE BONDS YOU CAN AFFORD . . . TURN IN ALL THE SCRAP YOU CAN FIND

STEEL USER'S "Four Foot Shelf"

Complete Information on Ryerson Stocks in Four Handy Volumes



1. RYERSON STOCK LIST — BUYING GUIDE OF THE INDUSTRY

Listings of more than 10,000 kinds, shapes and sizes of steels at your fingertips! Engineered for convenience; quick tab-indexed; handy pocket size. The Ryerson Stock List is your guide to the world's most complete stocks of "Immediate Steel."

2. RYERSON STEEL DATA BOOK — THE STEEL MAN'S HANDBOOK

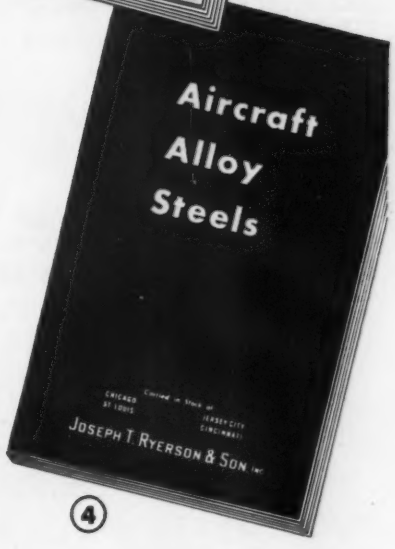
Helpful information on steel including charts; tables of weights and conversions; definitions of steel terms; standard specifications; steel-working hints and other basic information all fully described. Complete and authoritative; recognized for many years as a most useful steel book.

3. NE ALLOY STEELS — NEW NATIONAL EMERGENCY STEEL BOOKLET

New data on average physical properties and heat treatment response for thirty of the most widely used NE Alloys. Jominy End Quench Hardenability Testing fully explained with tables for converting hardenability into tensile strength, yield points, elongation and reduction of area. A manual of practical facts and figures for men working with NE Steels.

4. AIRCRAFT ALLOY STEELS — *NEW!*
DATA AND STOCK LIST OF AIRCRAFT ALLOYS

Manufacturers and sub-contractors building aircraft parts will be interested in this special information on Alloy Steels listed for quick reference. It also includes summary specifications of the AMS and the AN-S specifications.



If you have not received the new 1943-44 Ryerson Stock List write for your copy today. Other Ryerson Service Literature is also available on request. Joseph T. Ryerson & Son, Inc., Chicago, St. Louis, Milwaukee, Cincinnati, Detroit, Buffalo, Cleveland, Boston, Philadelphia, Jersey City.

RYERSON STEEL-SERVICE

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES and SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 112, No. 7 — July, 1943 — Founded 1880

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In This Issue

WE present for readers' judgment, beginning on page 39, our idea of a fuel conservation program.

Our idea of true fuel conservation is not a hoop-de-do campaign of flag waving, scare heads in newspapers, speeches by fat officials, radio nonsense—but is a dirty, grubby, drudging inspection of the heating system and everything pertaining thereto.

We believe that fuel cannot be saved with words, but can be saved by careful engineering inspection and analysis.

Such analysis presupposes the inspector knows all the measures which save fuel; knows whether such measures are practicable and justifiable; and can make the checks necessary to show what measures will give the greatest return for the least expenditure.

❖

Our suggested fuel conservation program is entirely engineering. We believe that most warm air heating dealers and engineers know all the things discussed in our special section, but perhaps have never had time to gather together all the data. If the material we present serves a useful purpose, we will feel repaid.

❖

We promised several issues back, an explanation of how to get materials for repair and maintenance. That promise was made just when PRP was changing to CMP and when all the repair orders were being reviewed and revamped to shift priority ratings higher and make materials easier to get.

So we could not deliver the article. We have been trying to get the article out ever since. Finally, the situation seems settled long enough for us to publish the promised article. We hope the whole program doesn't change while we go to press. If you want the latest word on materials for repair and maintenance, see page 26.

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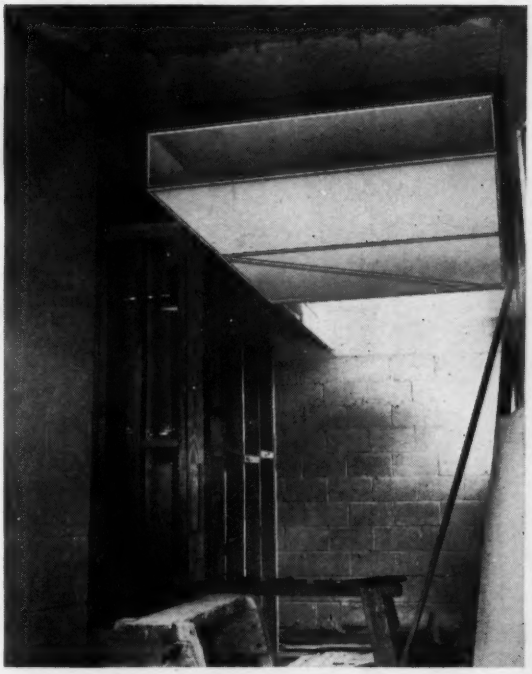
SAL-MO SUPPLY DUCT



A typical Installation of Sal-Mo Supply Duct in a War Housing Project.

Showing a partially completed duct. Metal was used only for Hangers, and Fittings.

SAL-MO Supply Duct is the non-metallic material for constructing supply and return ducts for Warm Air Heating, Ventilating and Air Conditioning systems. Its use permits many installations that would otherwise be impossible because of the Government rulings restricting the use of metals.

Sal-Mo Supply Duct is pre-fabricated and packaged at the factory. It is quickly installed, saving not only hours in erecting time, but also important savings in shipping, trucking and storing.

Ducts constructed of Sal-Mo Supply Duct are tight, quiet, insulated and fuel saving. The low conductivity rate of this material assures efficiently operating Duct systems for both heating and cooling. Smooth interior surfaces give low friction loss. Air tight construction prevents heat loss.

Sal-Mo Supply Duct is made in 26 Standard sizes, 4′ lengths for all domestic and industrial requirements.

If Duct sizes required exceed the Standard *Pre-fabricated* Dust dimensions, Sal-Mo Supply Duct Flat Sheets may be used. This allows for Duct fabrication on the job as this material may be formed by various accepted methods.

Approved and Listed by UNDERWRITERS' LABORATORIES, INC.

Sal-Mo Supply Duct is tested for Fire Hazard Classification; Fire Spread; Inflammability, and Moisture Absorption.

SALL MOUNTAIN COMPANY

Phone Andover 2414

176 West Adams Street **Chicago 3, Ill.**

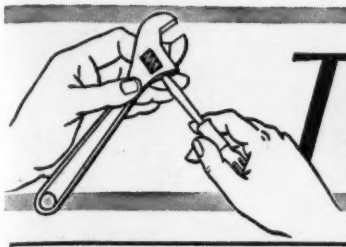
Getting YOUR Share of Summer Service Business?

To help G-E Dealers even out their service business—getting *more* this summer, cutting down on the Fall rush—is the purpose of these three national ads, appearing in *American Home* and *Better Homes & Gardens*. For your local use—to tie-in with this campaign—General Electric has prepared special newspaper advertising mats and post card mailers which are available through your G-E Heating Distributor.

If you are not now using these promotional tools to help stimulate summer service agreements, plan to do so—today! There's plenty of service work to be done—and every job that you do this summer will mean one less "rush job" next fall!

General Electric Company, Heating Division 3537, Air Conditioning and Commercial Refrigeration Department, Bloomfield, New Jersey.

GENERAL ELECTRIC



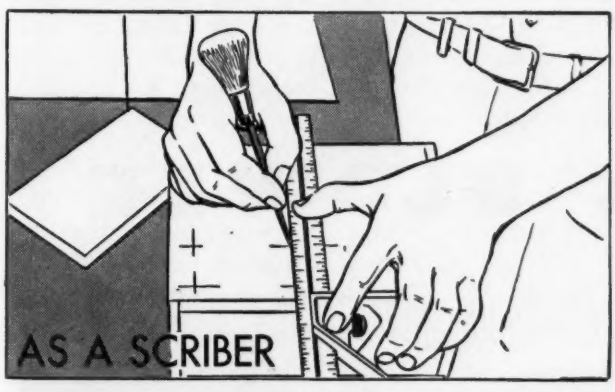
TOOL NOTES

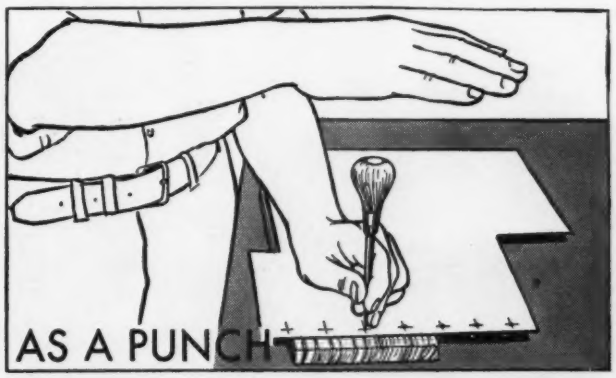
"How To Do It" Information For Crescent Tool Users

No. 12 . . . HOW TO USE CRESCENT SCRATCH AWLS

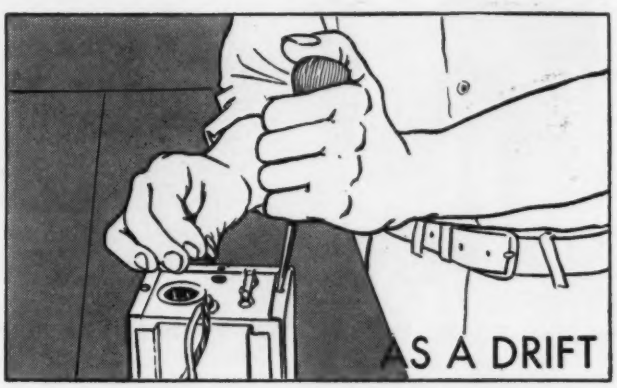
For piercing holes in any relatively soft material — wood, leather, linoleum, fabric, fibre, etc. — Crescent Scratch Awls should be used as illustrated below, or the point located and the handle then struck a smart blow with the palm of the hand. Carpenters use this tool extensively for starting screws in soft wood.

For scribing metal and other hard surfaces, the Crescent Scratch Awl is a useful tool. It should be tilted slightly sideways as shown below in order that the extreme point will scribe close to the straight-edge or rule. Maintain this same side angle while scribing and straight, accurate markings will result.





When working with light sheet metal, the Crescent Scratch Awl may be used as a Prick Punch or for piercing holes. Used as a Prick Punch, a hand or light hammer blow is required; for piercing holes, either a blow or steady hand pressure may be used. Use a wood block beneath the metal.



As a drift or driftpin for lining up bolt or rivet holes in light work, the Crescent Scratch Awl is very useful. Its sharp-pointed, tool-steel blade provides a gentle taper from 0 to 1/4 inch, making it an ideal tool for bench and other light assembly work.

MAIL THE COUPON . . . for Free Reprints of this series of informative ads. Please indicate whether you want them for bulletin board use, or punched for 3-ring binder.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

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Give Wings to Work

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GREAT NAMES in American Progress

ROBERT FULTON, BOAT BUILDER — On a fateful Friday in 1807, a skeptical crowd gathered at the foot of Cortlandt Street, New York. They came to watch "Fulton's Folly" attempt the "impossible" by traveling without sails from New York to Albany. Those who came to jeer stayed to cheer. "Crazy" Bob's puffing, snorting Clermont wheezed away from the jetty and grunted upstream against the wind at the miraculous speed of four miles an hour. On that day, Robert Fulton, well-nigh penniless dreamer, revolutionized the water-borne transportation of the world.

AMERICAN BLOWER

American Blower products have contributed much towards the progress of American industry — progress that today is making it possible for America's vital industries to outproduce the world. In the great public utilities, the steel industry, in the manufacture of petroleum products, chemicals, in food processing, mining, smelting and refining, in hospitals, schools, public buildings and homes, American Blower air handling equipment has kept pace with progress.

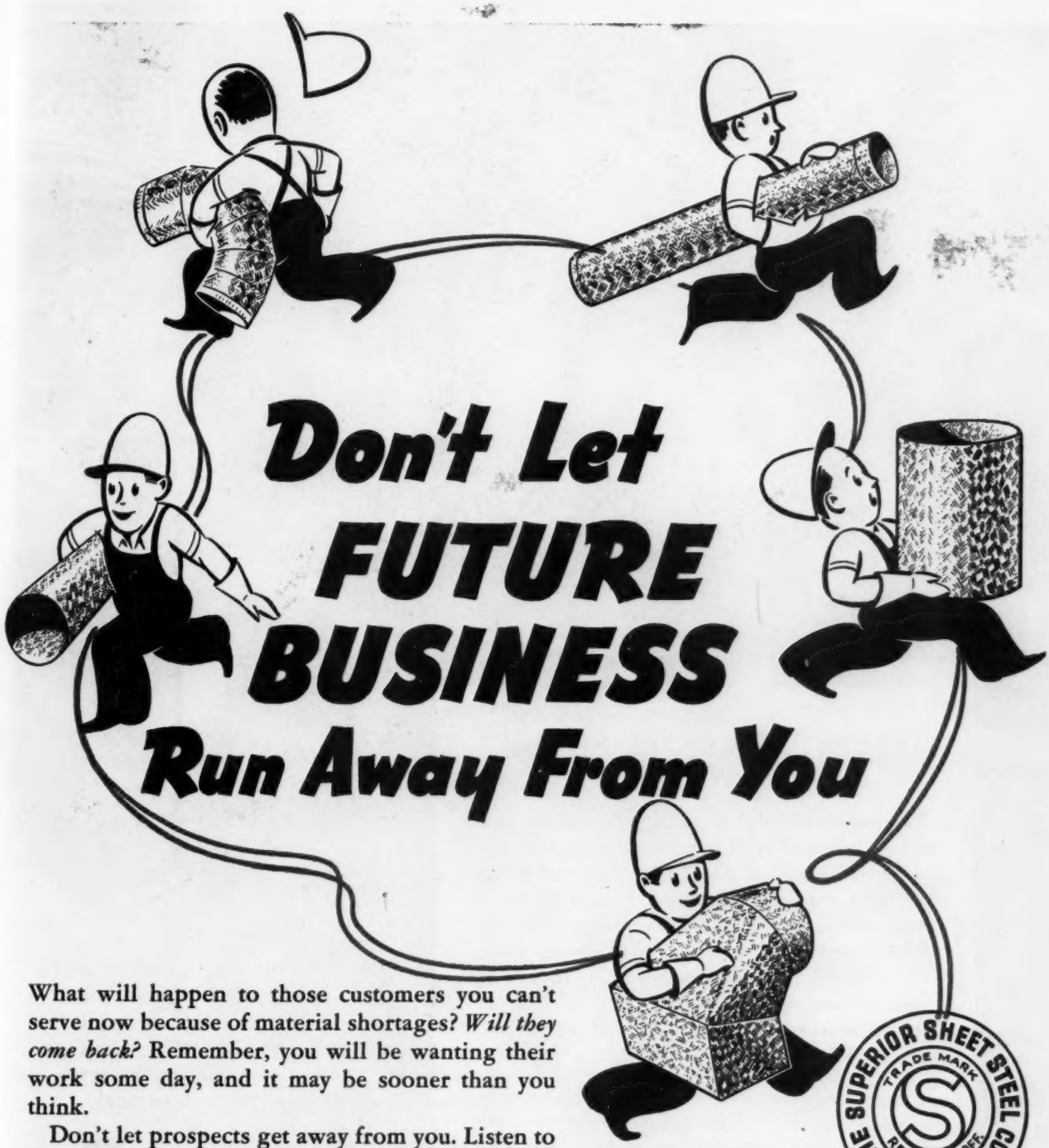
Utility Set

CONTRACTORS—DEALERS— We're working 100% for victory. But you can still buy American Blower products for vital war work. After victory we'll be ready with the most complete line of heating, ventilating and air handling equipment in history.

ARMY E NAVY

For excellence in production

AMERICAN BLOWER CORPORATION, DETROIT, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO
Division of AMERICAN Radiator and Standard Sanitary Corporation



Don't Let FUTURE BUSINESS Run Away From You

What will happen to those customers you can't serve now because of material shortages? *Will they come back?* Remember, you will be wanting their work some day, and it may be sooner than you think.

Don't let prospects get away from you. Listen to their problems. Discuss their jobs with them. Tell them they can depend on you to take care of them as soon as the demands of war ease up.

SUPERIOR sheets help you make the best of wartime shortages. Their exceptional working and forming qualities help both labor and material to go further on the job.

THE SUPERIOR SHEET STEEL COMPANY, Canton, Ohio

(Division of Continental Steel Corp., U.S.A.)

THE SUPERIOR SHEET STEEL CO. TRADE MARK S REG. U.S. PAT. OFF. CANTON, O.

THE SUPERIOR SHEET STEEL CO. COPPER STEEL COPPERIOR SHEETS CANTON, O.

THE SUPERIOR SHEET STEEL CO. TRADE MARK CHECKER COAT REG. U.S. PAT. OFF. CANTON, O.

NTINENTAL UPERIOR STEEL

SUPERIOR

CONTINENTAL STEEL CORPORATION

STEEL...AND ITS FUTURE

You and we of the sheet metal industry have good reason to look forward to post-war days. Not only will steel be more plentiful then than ever before but there will be a multitude of new uses for it and new products being made. Also, as the nation's steel makers put their efforts to peace-time work, the invaluable experience and research information they are now accumulating will bring forth newer steels, heretofore unthought of, with remarkable new qualities.

Even the scarcity of steel which we are now experiencing will work for us in peacetimes because our markets are growing bigger and bigger day by day as replacement needs pile up. These include not only maintenance and repairs but all of the new building work now held up because of war-time restrictions.

Wishful thinking? Not at all—and we should all prepare for the future by making plans for it today.

THE J. M. & L. A.
OSBORN Co
CLEVELAND, OHIO
BUFFALO • CINCINNATI • DETROIT
Manufacturers—Distributors of Metals and Metal Products

Guns, tanks and ships are made of steel, but they're paid for with the money all of us put into War Bonds.

Buying all the Bonds we can will help speed Victory. At the same time, it will also insure our having the savings with which to buy peace-time products which, in turn, will provide jobs for our fighting men when they return home.

A DEPENDABLE SOURCE OF SUPPLY FOR 84 YEARS

JOBBERS...DEALERS...

Count SYNCROMATIC First in Your Post War Planning!

Write for this folder TODAY to Plan Soundly for Tomorrow!

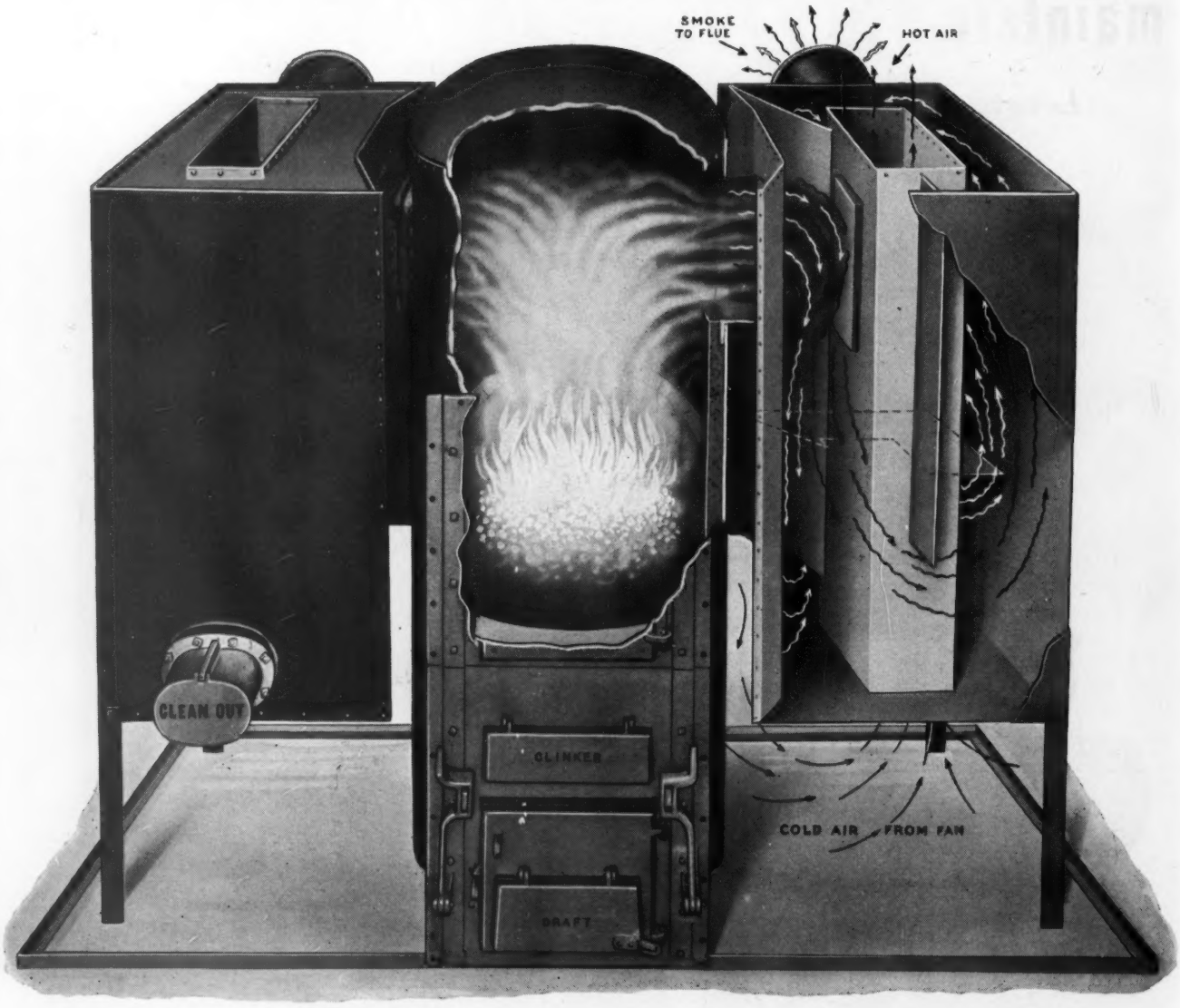
✓ Syncromatic products include *all* the fundamentals, plus all the exclusively engineered Syncromatic features, to guarantee complete satisfaction to all consumers in the big post-war market that lies just ahead.

Syncromatic offers you all of its distinctive product advantages, backed by a live manufacturing organization that will work with you every minute! Write today for your free copy of the folder illustrated above which gives you all the facts on Syncromatic coal-fired steel furnaces. Make this folder the basis of your post-war planning now!

SYNCROMATIC CORPORATION

3373 No. Holton St. ***Manufacturers*** **Milwaukee (12), Wis.**

PEERLESS *Commander* Heavy-Duty FURNACE



CAPACITY — ¾ MILLION B. T. U.'s

FOR EXTRA LARGE BUILDINGS, SCHOOLS, BARRACKS, FACTORIES, ETC.

Note the dual radiators, which practically double the heating surface of this big heavy-duty furnace. Note (arrows) the long travel of smoke and gas through radiators to smoke pipe. Note how heat divides and goes equally into the two radiators—also how the series of baffles force the heat to outside surface of radiators, where it is wiped off by return air from blower.

Note the large size combustion chamber. Total grate area, 1,048 square inches. Locomotive type grates. Total heating surface, 30,959 square inches . . . Built of extra heavy boiler plate, riveted and welded. Smoke-tight, gas-tight, dust-tight. Burns either coal, coke or wood. Adaptable to either hand-firing or stoker operation. For most efficient operation a PEERLESS Cleanaire Blower is needed. Available under W.P.B. regulations.

Wire or Write for Descriptive Literature and Complete Information.

THE PEERLESS FOUNDRY COMPANY, Indianapolis, Ind.

Pioneers in Warm Air Heating for Over a Third of a Century

RANDALL BEARINGS are helping industry maintain its amazing war production pace

Learn today about

Randall

BEARINGS

Every week the ... "E" is awarded to plants that are breaki... records in war production work. Many of them have expressed appreciation to Randall for help in winning this coveted award.

RANDALL BEARINGS HAVE BEEN INSTALLED ON ALMOST EVERY TYPE OF WAR PRODUCTION EQUIPMENT TO KEEP SHAFTS TURNING ENDLESSLY FOR VICTORY.

Bearing users may have trouble getting certain kinds. Or perhaps you need a bearing that will do your job better. You can answer both these problems by consulting Randall engineers. Randall Graphite Bronze Bushings are av... in all sizes and many styles. Randall self-aligni... cating Pillow Blocks may be adapted to you... tions. Easy to install, s-m-o-o-t-h and quiet in ... on, Randalls are an over-all economy, for besides ... ir low original cost, they require only minimum fiel... maintenance. Draft Randalls for your equipment, and they'll be in your service for life.

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also ARMS for AMERICA'S FIGHTING FORCES

Air Control Products, Inc.

COOPERSVILLE • MICHIGAN

Cool, clean air for sea fighters

A modern battleship is a giant steel honeycomb, crammed with complicated piping, myriads of electrical cables, huge boilers, turbines, equipment of every sort.

Men move in this labyrinth through shoulder-wide access hatches, along corridors so cramped that two men can scarcely pass. Many stations are buried deep in the center of the mammoth armor-plated hull. Cool, fresh, clean air must be continuously fed to every man on a battlewagon if he is to do his job efficiently.

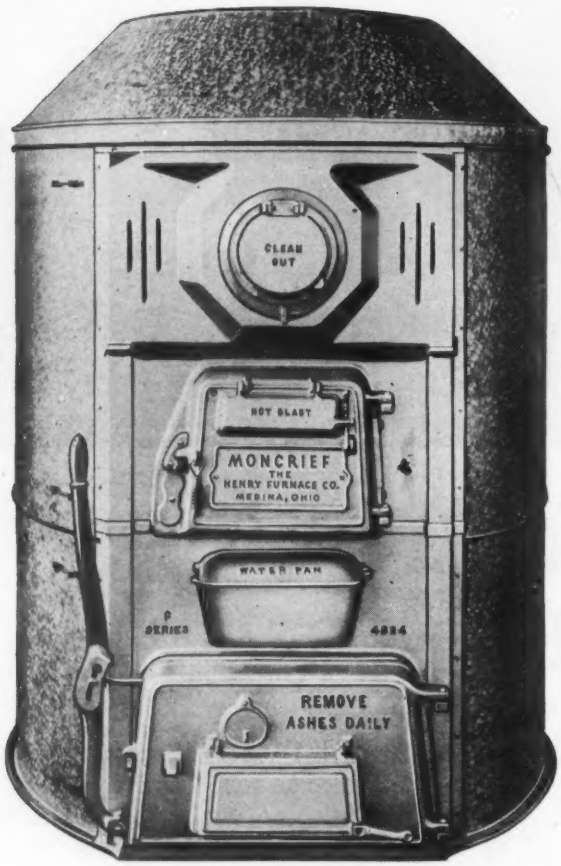
Here's where Bethlehem Galvanized Steel Sheets are now at work—thousands of tons of them—in battleships, carriers, cruisers and destroyers. Sheet steel goes into air ducts by the mile—as well as into bulkheads, safety doors, galley equipment; it handles dozens of jobs which are vital to the efficient functioning of vessel and crew. Sheet steel is definitely a key material in our rapidly expanding Navy, and in the swiftly growing fleet of cargo vessels which supports fighting Americans on distant battlefronts.

BETHLEHEM STEEL

BETHLEHEM STEEL SHEETS

MONCRIEF

A Quality Product for Over 40 Years



SERIES C
Coal-Burning Hand Fired Furnace

FOR almost 50 years the name MONCRIEF on a warm air furnace or air conditioning unit, a repair part or pipe and fittings has identified these products as honestly built and soundly engineered—designed and constructed to give the buyer as much dollar value as could be obtained anywhere.

This is the reason why the name MONCRIEF has always occupied a place in the front rank of the warm air heating industry.

The name MONCRIEF is going to continue to stand out as one of the leaders in the warm air heating and air conditioning industry, as it is the desire and determination of The Henry Furnace Company to design and manufacture, to the best of their ability a complete line of high quality warm air heating and air conditioning equipment, furnace pipe and fittings.

GENUINE MONCRIEF REPAIR PARTS ASSURE SATISFIED CUSTOMERS

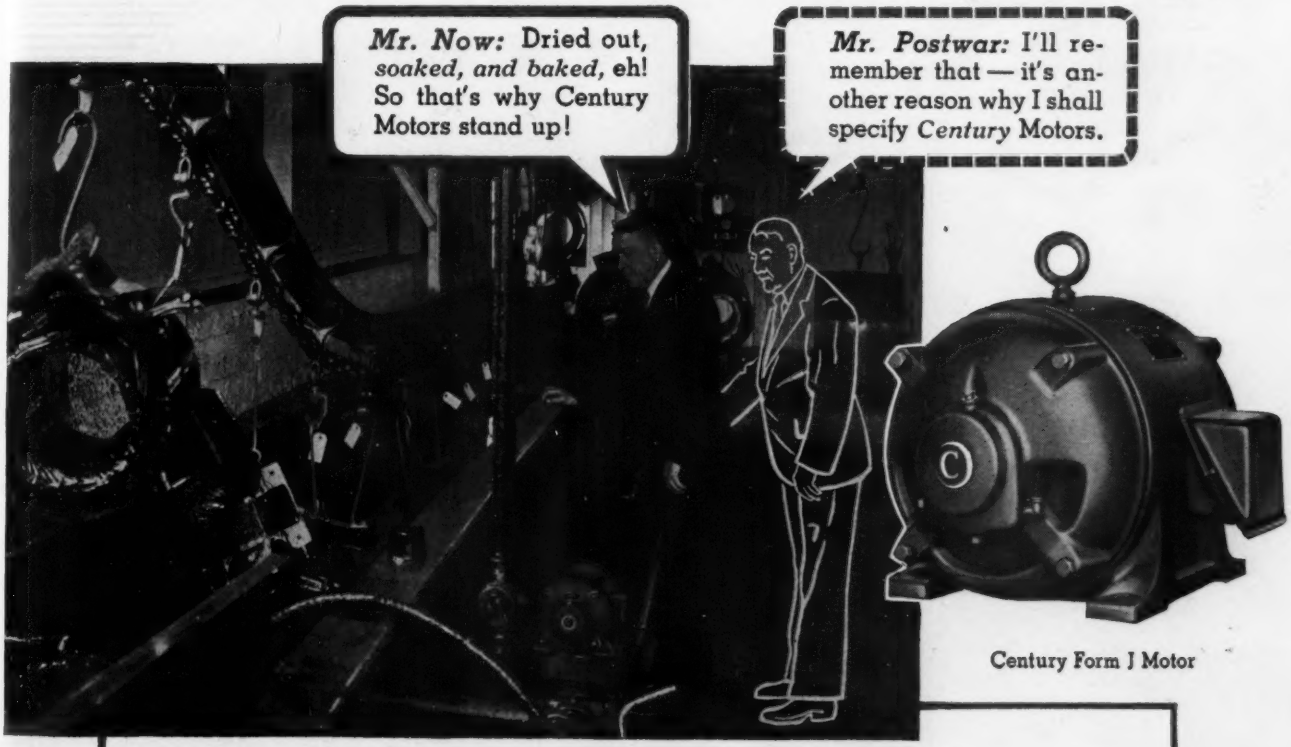
WARM AIR FURNACES
FURNACE PIPE
AND FITTINGS

MONCRIEF

AIR CONDITIONING
SYSTEMS FOR
COAL . . . OIL . . . GAS

THE HENRY FURNACE COMPANY - MEDINA, OHIO

Take a Look at TOMORROW—*Today!*


Mr. Now: Dried out, *soaked, and baked,* eh! So that's why Century Motors stand up!
Mr. Postwar: I'll remember that — it's another reason why I shall specify *Century* Motors.

Century Form J Motor

The Protection of
CENTURY INSULATION
Assures Continuous Motor Performance Under the Toughest Conditions

By the use of slow-moving conveyors and automatically-controlled ovens, the completed stator and winding of Century Motors is dehydrated, and then is submerged in and passes through a tank filled with Century "Clingto" insulating varnish, and then baked. This process is repeated as necessary to preserve and seal the winding into a homogeneous mass.

This is followed by a final coat of Century "Protecto" insulation compound which places a heavy exterior protecting armor over the entire winding.

Century slot insulation is built up with fibre board for mechanical strength and varnished cloth for dielectric strength.

The entire Century insulation process produces a winding that is highly resistant to moisture, to tropical climatic conditions, to mild acid and alkali fumes, and to the effect of magnetic vibration and the mechanical impact of particles carried by the cooling air.

Such insulation material and treatment is absolutely necessary for motor protection for long operating life.

Your nearest Century Application and Service engineer will gladly give you full details of all the advantages of Century Motors—show you why thousands of plants rely on Century for continuous, all-out production.

Century MOTORS
1/6 to 600 horsepower

CENTURY ELECTRIC CO.
1806 Pine Street
St. Louis, Missouri
Offices and Stock Points in Principal Cities

307

One of the Largest EXCLUSIVE Motor and Generator Manufacturers in the World.

Detroit Lubricator products are making a vital contribution to the foremost problem we all face today—beating the Axis.

Not all the story of our products can be told until after the war, but we can tell how "DL" Controls are serving on our fighting ships and in our Merchant Marine. "DL" Engine Safety Contact Makers guard Diesel engines from damage due to insufficient cooling or lubrication. "DL" Refrigeration Controls keep food fresh and wholesome on its way to our boys on foreign soil or to hungry peoples of conquered nations.

Some day, when Mr. John Q. Public can buy heating and air conditioning equipment again, "DL" Controls, radiator valves, air valves and other heating and refrigeration equipment will once more find their way into thousands of homes and industries.

If you want any information on "DL" Products, or if you have a control problem on maintenance, or otherwise, drop us a line. We are busy, but not too busy to give you every service which war production permits.

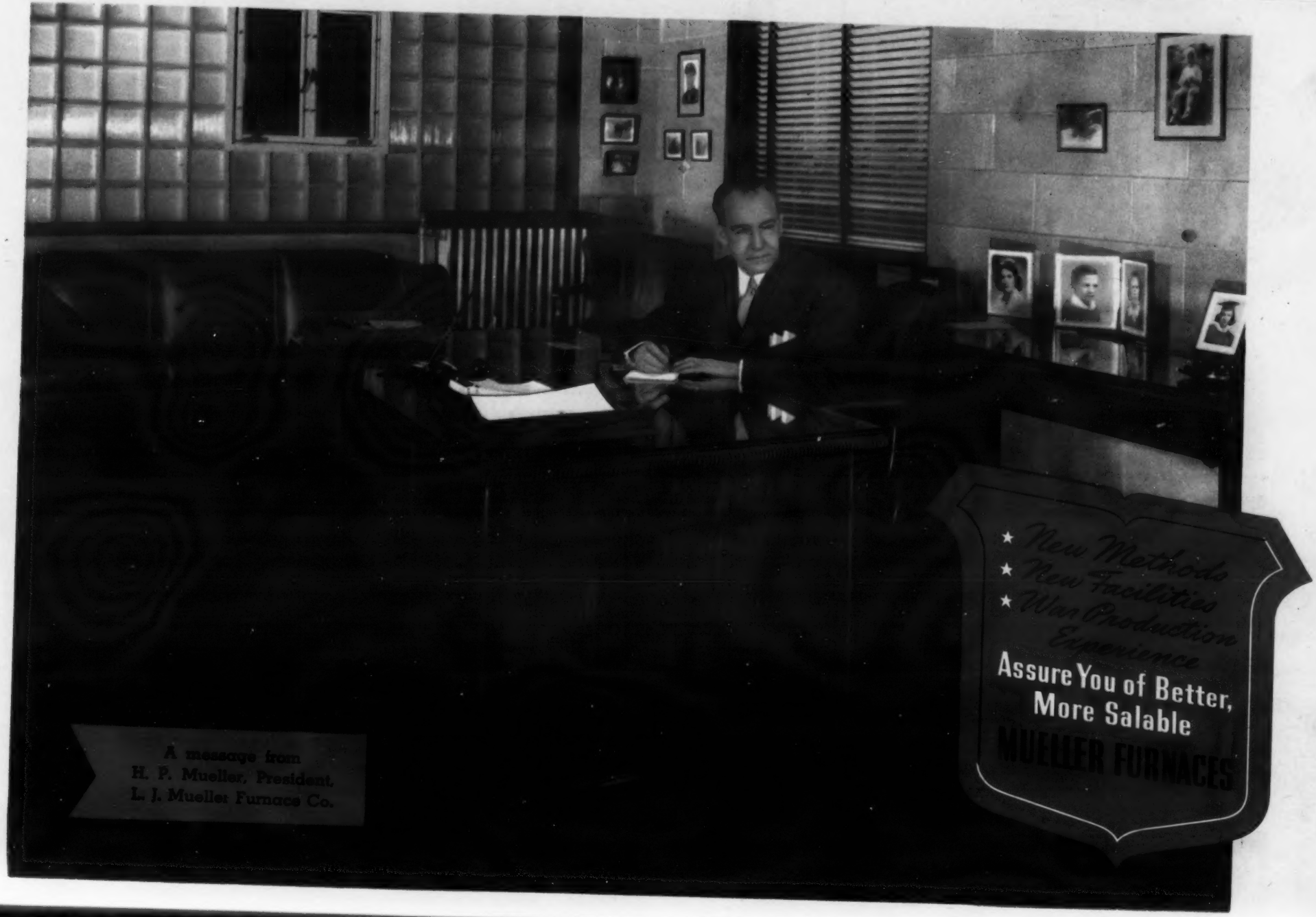
★

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Division of AMERICAN Radiator and "Standard" Sanitary Corporation

Canadian Representatives—Railway and Engineering Specialties Limited, Montreal, Toronto, Winnipeg


A message from
H. P. Mueller, President,
L. J. Mueller Furnace Co.
★ New Methods
★ New Facilities
★ War Production Experience
Assure You of Better, More Salable
MUELLER FURNACES

THE L. J. Mueller Furnace Company has passed through three previous major wars. We feel that our loyal customers and friends will be interested in knowing what we have been doing to help in the present war program.

In addition to supplying heating equipment in accordance with Government regulations, we have also been producing many items used in combat service. This activity has necessitated the addition of many new facilities including two very large electric hydrogen-brazing, hardening, and quenching furnaces; broaching machines; several gas-fired draw furnaces; a battery of immersion, molten salt-bath type furnaces; automatically controlled metal cutting saws; flame hardening equipment; centerless grinders; innumerable drilling machines; precision testing equipment; and many other smaller machines and tools.

In order to acquaint you with this new equipment we are going to run a series of color inserts in this magazine. These inserts will illustrate and describe the machines and processes we are employing in our war production.

We have likewise expanded our research and engineering departments for the further development and refinement of Mueller heating products in order that you may have outstanding heating equipment to offer your customers after the war.

The experience and knowledge gained through our war production will prove to be mutually advantageous during the peace-time period that will come after Victory.

President
L. J. MUELLER FURNACE COMPANY

MUELLER *Milwaukee*
HEATING AND AIR CONDITIONING

ORDNANCE
UNITED STATES ARMY

The Army Ordnance Banner—awarded to Mueller for outstanding performance in war production.

More Air Per Pound of Steel

with MORRISON *Airstream* BLOWER WHEELS

30-40% less steel . . . fabricated on automatic equipment . . . patented construction

● Due to scientific design, streamlined air inlets and elimination of excess metal, MORRISON *Airstream* Blower Wheels deliver more air per pound of steel.

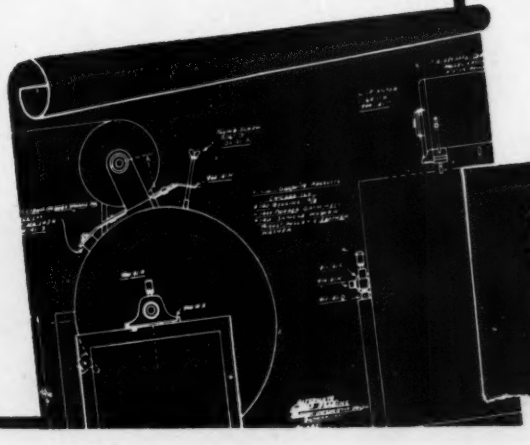
Our patented hub construction, which eliminates the use of cast iron or screw machine parts, together with our one-piece construction, reduces weight to a minimum.

Yet the wheel is stronger and more rigid, true running and quiet. The one-piece blade group is made from one continuous strip of steel, then spot-welded to the channel-shaped end rings. This eliminates chance of loose blades and reduces vibration to a minimum. This patented construction on modern automatic equipment produces savings in steel and labor which are passed on to you.

The Modern Morrison Way Conserves Vital Steel—Aids Victory

Build Your Own Blower Assemblies

By using *Airstream* Blower Wheels and taking advantage of our engineering service you can build your own blower assemblies at a substantial saving. We'll furnish proper scroll design for your requirements and complete detail working drawing. If desired, one of our engineers will call.



MORRISON PRODUCTS, INC.
EAST 168TH & WATERLOO ROAD
CLEVELAND, OHIO

Let the Eagle Scream

Sure, let 'im scream—why not? We consider a good healthy scream every now and then very much in order these days.

But you'll pardon us if we don't have time to stop and listen, for we at Penn Boiler are much too busy giving the Old Bird something to scream about to stop for anything!

We're working hard—we're working on two fronts, and naturally our attitude isn't purely altruistic—for while we're making materials of war we're also making plans for peace; a peace we will have helped to bring about.

And while our factory, like the Mills of the Gods, grinds and grinds, we're simply bu'sting to tell you what's been going on in our laboratories.

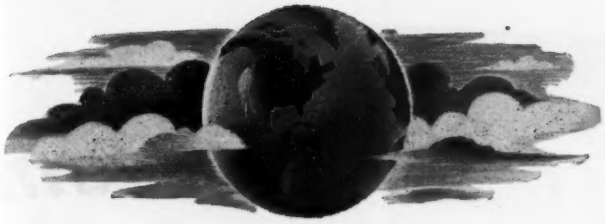
Comes V-day—

YOU CAN EXPECT GREAT THINGS FROM PENN BOILER!

PENN BOILER & BURNER MFG. CORP.

E. C. STAUFFER, PRESIDENT

LANCASTER, PENNA.



LOGISTICS is the word for the exact military science of supply and delivery. Upon the speed and facility with which this branch of the service can function depends the eventual outcome of the war. On the factory front, too, adequate supply and delivery of raw materials are just as vital.

And that is where Federated Metals steps in. With its geographically strategic plants and distributional centers adjacent to or an integral part of every important manufacturing center, Federated is equipped and keyed to fill wartime's demands for non-ferrous metals of dependable quality.

Today, Federated's traditional skill, research and manufacturing facilities are devoted – 24 hours around the clock – to the production of more and more perfect ingots for the needs of industry. Tomorrow, these better metals will be available to help you meet the post-war battle of competition. *For information, contact your nearest Federated Sales Office.*

Logistics

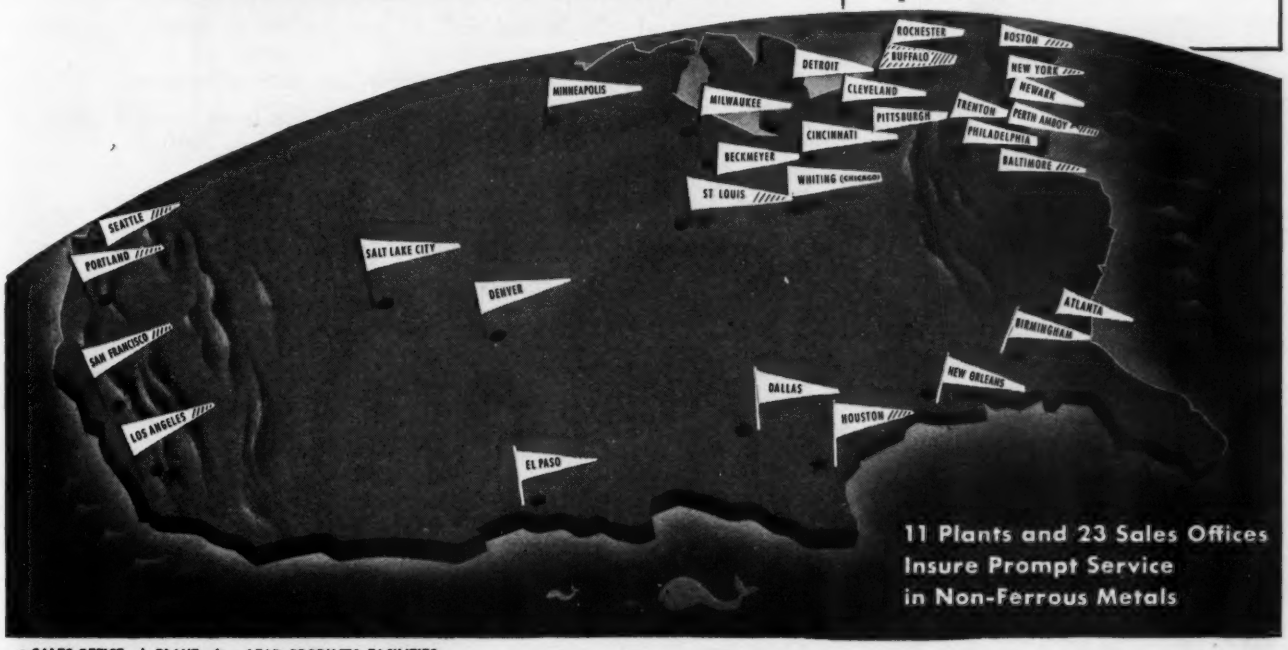
is another word for

SERVICE!

PRODUCTS PRODUCED BY FEDERATED METALS

ALUMINUM	SOLDER
BRASS	BABBITT
BRONZE	TYPE METAL
ZINC	LEAD

All of these in all commercial forms – Special Alloys to your specifications.



●SALES OFFICE ★PLANT ////// LEAD PRODUCTS FACILITIES

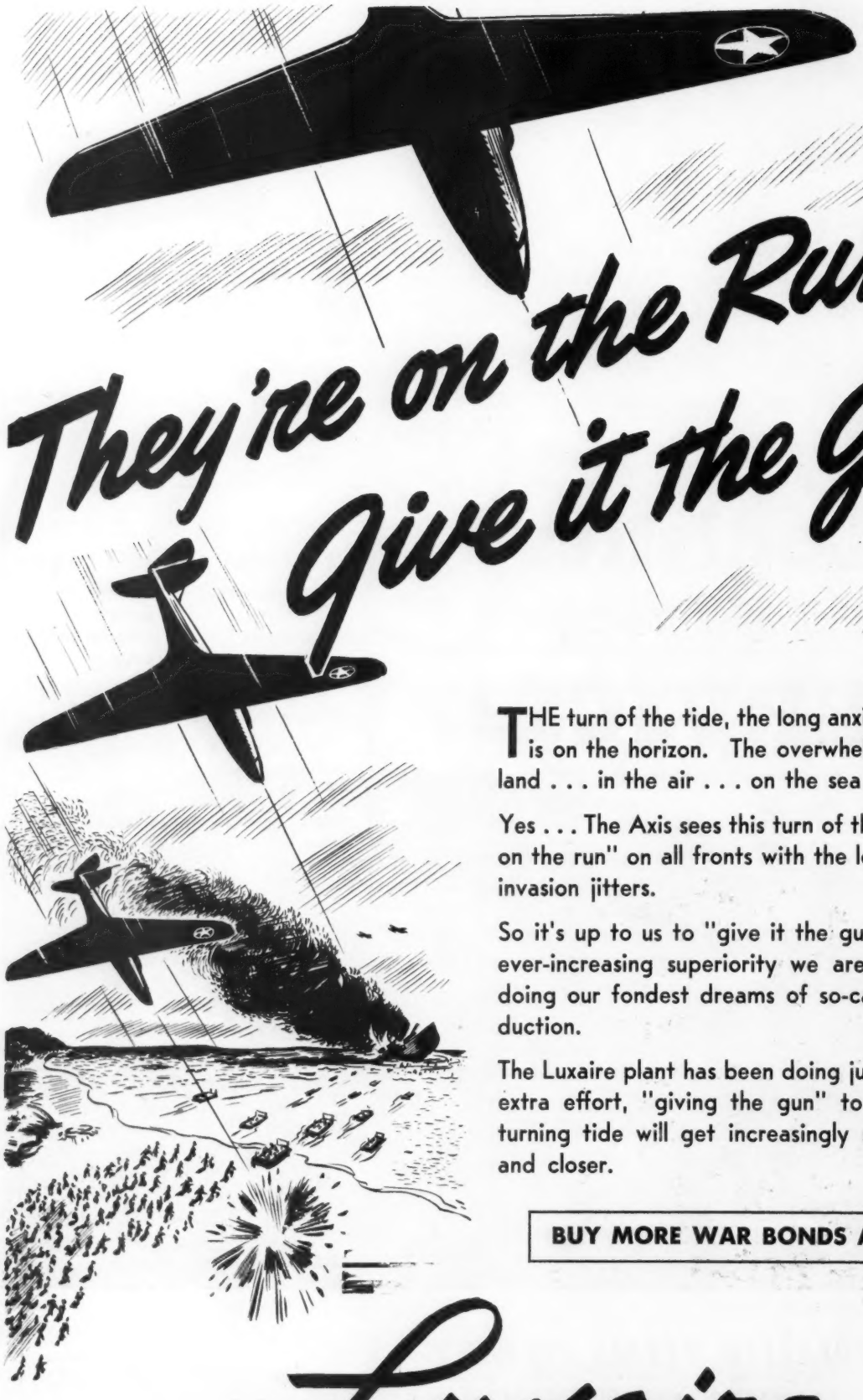
FEDERATED METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY

SALES OFFICES
ATLANTA, GA.
BALTIMORE, MD.
BIRMINGHAM, ALA.
BOSTON, MASS.
CINCINNATI, OHIO
CLEVELAND, OHIO
DALLAS, TEXAS
DENVER, COLO.
DETROIT, MICH.
LOS ANGELES, CAL.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
NEW YORK CITY
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
ROCHESTER, N. Y.
SALTLAKECITY,UTAH
ST. LOUIS, MO.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
WHITING, IND. (Chicago)

PLANTS
BECKMEYER, ILL.
DETROIT, MICH.
HOUSTON, TEXAS
LOS ANGELES, CAL.
NEWARK, N. J.
PERTH AMBOY, N. J.
PITTSBURGH, PA.
SAN FRANCISCO, CAL.
ST. LOUIS, MO.
TRENTON, N. J.
WHITING, IND.

FMD
FEDERATED METALS DIVISION
AMERICAN SMELTING AND REFINING COMPANY



They're on the Run — Give it the Gun!

THE turn of the tide, the long anxiously awaited event is on the horizon. The overwhelming supremacy on land . . . in the air . . . on the sea is within our grasp.

Yes . . . The Axis sees this turn of the tide and "they're on the run" on all fronts with the long feared cases of invasion jitters.

So it's up to us to "give it the gun" to speed up the ever-increasing superiority we are achieving by outdoing our fondest dreams of so-called maximum production.

The Luxaire plant has been doing just that, making that extra effort, "giving the gun" to production so the turning tide will get increasingly stronger and closer and closer.

BUY MORE WAR BONDS AND STAMPS

Luxaire

WARM AIR FURNACES . . . AIR CONDITIONING UNITS . . . COAL . . . GAS . . . OIL

THE C. A. OLSEN MANUFACTURING CO., ELYRIA, OHIO

Vol. 112 American Artisan No. 7

Fuel Conservation—Our War Contribution

THE question which pestered home owners all last winter—must I convert from oil to coal—has been settled. On May 10 Price Administrator Prentice Brown issued a covering statement which declared that conversion of *domestic* heating plants will not be required for the coming heating season.

While this decision settles the question of conversion it does not settle the question of how to be comfortable on the reduced gallonage householders were given last winter and will be given this coming winter.

And this, in turn, points to an active market for the services of the heating dealer—the servicing of oil burning and coal burning plants in order that the greatest possible comfort may be obtained from the amount of oil or coal given the householder.

We would like to point out that last winter's experience in oil heating was both interesting and instructive. In general, last winter's experience scotched many half truths which have been bandied around the industry.

For instance, it seems quite agreed that a fireplace is a very poor substitute for a central heating system. You may be able to scorch your front while your back freezes, but to try to heat a large room—to say nothing of a whole floor—with a fire place is just so much lost argument. And unless the thermostat is in the fire place room you don't save fuel because you only overheat the fire place room; the rest of the house carries along at the thermostat setting.

You may save fuel by keeping the fire place room warm and the rest of the house cold, but in general a fire place is not much help in keeping comfortable.

We also learned that shutting off rooms to save fuel—just by closing radiators or registers and pulling the room door shut—saves an infinitesimal amount of fuel. This procedure only moves outside walls indoors; you never really keep the closed room closed; there are few houses where this idea really reduces the overall heat loss enough to save much fuel. What has to be done is to *seal* the rooms and this usually isn't done.

Similarly, hanging heavy drapes over windows, placing drapes in stair doors, pulling window shades, keeping the basement cold, will save a few Btu's on paper, but in everyday living, the way most houses are laid out the total saving is negligible.

We have found that the real fuel saving devices are precisely those devices this industry discovered years ago in its research tests and which we have publicized consistently for years and years. These real fuel savers are—greater heating plant efficiency, insulation, storm sash and doors, weatherstripping, and combinations thereof.

Which brings us back to the third paragraph of this editorial. We will find now and this coming winter a ready market for our services in putting heating plants in the best possible operating condition. If we want to sell insulation (or even storm sash) we can combine the sale of these materials with our heating plant service.

Now that home owners know they do not have to convert, but do have to lay plans for keeping comfortable with less oil (and perhaps less coal) it ought to be easy to sell any service which guarantees better plant efficiency.

It should be pointed out that it is strictly the furnace man's choice whether he makes business for himself or just lets the whole proposition slide. Government is going to do little to urge the home owner to use our service. Fuel dealers will probably do the most they can to get service jobs, but fuel dealers face a worse manpower problem than we do. Home owners will give the matter considerable thought, but home owners don't know what they need and they don't know where to go to get what they need. It is up to us to advertise our ability and service.

And we feel urged to emphasize that this problem goes far beyond the simple furnace cleaning job we have heretofore sold as heating plant efficiency service. Cleaning is only the beginning—the door opener, if you please—we can, and we should, be ready to give a scientific, thorough efficiency service.

The many variables involved in such a service are itemized in the Fuel Conservation Section in this issue. If you are prepared to give your cus-

(*Continued on page* 91)

How To Get Materials For Maintenance and Repair

IN THE MARCH, 1943, issue we announced that an article scheduled for that issue explaining how to get materials for maintenance and repair had to be postponed because our explanation was not completely correct. Ever since March we have been trying to get that article published, but changes in procedure for getting repair materials have been "on the fire" in WPB and only now do we feel that an explanation can be satisfactory.

So—here's how to get material for maintenance and repair after July 1.

Why July 1? Because on July 1 the Controlled Materials Plan becomes fully operative and from then on materials for new construction and materials for maintenance and repair will be obtained in a different manner than heretofore.

After July 1 customers will still apply for permission to start new construction if the cost exceeds stated sums as given in L-41. Again, maintenance and repair are expected and no permission is required. And you still get a certification on the order from your customer and you still place a certification on your order for materials to your supplier. But you do use different forms and you get different numbers and ratings.

Under CMP, as most readers know from our previous reports, one regulation (CMP 5) controls distribution of materials used in repair and maintenance. CMP 5 divides *producers* or *users* into different classifications. Each such classification has been given its own preference rating.

To explain, let us assume that you are a heating-sheet metal contractor and that you are going to get maintenance and repair work from customers. The first thing which will be different is that there will be different types of customers under CMP than there were under PRP. So we will list several types of customers and show what happens.

Customer No. 1—Manufacturer of Plane Parts

This manufacturer is listed in CMP 5 as a Schedule 1 producer. Schedule 1 producers are entitled to use an AA-1 rating to get repair and maintenance materials. So customer No. 1 sends you an order for, let us say, repair to one of his blow pipe systems, and on the order he certifies as follows:

> "Preference Rating AA-1-MRO. The undersigned certifies, subject to the criminal penalties for misrepresentation contained in Section 35 (A) of the United States Code, that the items covered by this order are required for essential maintenance, repair or operating supplies; that this order is rated and placed in compliance with CMP Regulation No. 5; and that the delivery requested will not result in a violation of the quantity restrictions contained in paragraph (f) of said regulation."
>
> .....
>
> (Name of Firm)
>
> Date..... By..... .....
>
> (Authorized Official)

If you expect to get repair work from industry you should have a copy of CMP 5, which has the list showing what types of producers get AA-1 or AA-2 or AA-5. Get a copy from your local WPB.

Customer No. 2—Furniture Factory

This manufacturer, according to CMP 5 is a Schedule 2 producer. As a Schedule 2 manufacturer he is entitled to use an AA-2 rating to get repair and maintenance materials. So when his wood waste collecting cyclone is ripped open in a high wind he sends you an order to repair it and on his order to you he places the same certification as shown for customer 1 except for the rating.

Customer No. 2's certification will then begin like this—

> "Preference Rating AA-2-MRO. The undersigned certifies . . ." and so on just the same as the certification preceding.

Customer No. 3—Public Garage

The garage has been taken over by a new owner and he needs his roof repaired and the exhaust system from his paint spray room taken down, cleaned and broken parts replaced.

A garage or a commercial establishment of any type is neither Schedule 1 or 2 producer but is miscellaneous. As such this firm is entitled to an AA-5 rating on repair and maintenance materials. So on the garage owner's order to you he certifies—

> "Preference Rating AA-5-MRO. The undersigned certifies that . . ." and so on again just like the certification used by customer No. 1.

Customer No. 4—Home Owner

This home owner's furnace needs repair and his gutters need partial replacement. The home owner does not come under CMP 5. He doesn't come under any part of CMP. CMP is for industrial and commercial customers.

Home owners will still get their repair and maintenance work done under priorities. So for Customer No. 4 you will proceed with the furnace and gutter work just as you have during the last year, under P-84. P-84 has been used so long it should not need any explanation here.

Quantity Limitations

To go on with CMP repair and maintenance, "is there limit to the amount the customer can order?"

Yes. CMP 5 says—

"(f) Quantity Restrictions. (1) No person who uses the allotment ratings assigned by this regulation to obtain any maintenance, repair or operating supplies shall order for delivery in any calendar quarter maintenance, repair or operating supplies in an aggregate amount exceeding one-fourth of his aggregate expenditures for maintenance repair and operating sup-

plies during the calendar year 1942 (or his fiscal year ending December 31, 1942), except that a person engaged in a seasonal business may use such allotment symbol or preference ratings to order for delivery during any calendar quarter up to, but not in excess of, his aggregate expenditures for maintenance repair and operating supplies during the corresponding quarter of 1942 (or of such fiscal year)."

There's some more to this section, but the contractor is not especially concerned with the industrial user's quantities. It is up to the customer to determine his quantities. It is the customer who violates the order.

But this matter of allowable quantity might be of some concern to the contractor with small commercial customers who may not have bought any repair in 1942, but needs repair in 1943. Generally, the customer who bought no repairs in 1942 may buy up to $5,000 worth in 1943 by using the certification shown above. In case of any doubt consult the WPB.

How You Get Materials

So far the discussion has covered only how the customer orders from you and what his order should carry for certification. Now the question is, "how do you get materials to repair Customers 1, 2, 3 orders?"

CMP 5 says: "(3) A person with whom a delivery order is placed bearing a preference rating assigned by this regulation may, subject to the limitations contained in CMP Regulations Nos. 1 and 2, extend the rating in the manner provided in CMP Regulation No. 3 (using the endorsement therein specified or the alternative form of certifications provided in CMP Regulation No. 7)."

So when you order sheets to repair customers' 1, 2, and 3 buildings you make your order and on it place the following certification—

> "The undersigned purchaser certifies, subject to the penalties of section 35 (A) of the United States Criminal Code, to the seller and to the War Production Board, that, to the best of his knowledge and belief, the undersigned is authorized under applicable War Production Board regulations or orders to place this delivery order, to receive the item (s) ordered for the purpose for which ordered, and to use any preference rating or allotment number or symbol which the undersigned has placed on this order.
>
> .....
>
> (Name of Firm)
>
> Date..... By.....
>
> (Authorized Official)

Alternate Certification

The certification above (CMP Regulation No. 7) is quoted because you may buy a rubber stamp of this form and use it to extend all orders received under CMP. But as stated above you may use the certification from CMP Regulation No. 3 on CMP Regulation 5 orders. But CMP 3 certification does not apply to all CMP order extensions so the standard form will save time and trouble. If you want to use CMP 3 certification, get a copy from WPB or order the stamp from one of the stationary supply houses.

Maintaining Inventory

Lately, some difficulty has arisen over getting materials from warehouses for repair and maintenance. The contractor is given every legal right to purchase materials for home repair under P-84. Under P-84, the installer need not make application for preference rating A-10 before he applies his order. Anyone classified as an installer may extend this rating. The use of the A-10 rating is initiated by the installer. The supplier does not use this A-10, but gets his inventory through PD-1X and fills A-10 orders from inventory.

Right here, because there still seems to be some confusion, let us restate the mechanics of P-84 automatic ratings. P-84 says—

> "On any purchase order of $10 or less an item which costs the installer $4.99 or less is deemed an emergency item. No endorsement on the purchase order is required. If the total purchase order is more than $10, an endorsement is necessary even though no one item costs the installer more than $4.99. If the total purchase price is $10 or less, but one item costs $5, an endorsement is necessary.
>
> "Whenever the installer replaces—not repairs—a unit which costs him more than $50, he must secure a certification from the ultimate consumer and keep such statement attached to a copy of the order for two years. The certification must state that repair of the unit is impracticable and must specify—(1) the unit being removed; (2) part or parts of such unit which failed; (3) age, make, model, size, serial number of the unit which is being replaced; (4) replacing unit, make, model, size, serial number."

The trouble has been that under CMP 4, warehouses are supposed to get from the mills enough sheets on mill directives to permit the warehouse to sell customers up to 6,000 pounds of galvanized iron, 6,000 pounds of black sheets, and so on, on ratings as low as A-10 or even without any priorities. But the warehouses are not getting these quantities so they can't fill low rated orders.

Contractor's Inventory

There is an alternative under CMP which may be worth looking into. Section (g-1) of CMP 5 says—"A person engaged in such business (service repair shop doing maintenance and repair work) may, instead, request an allotment of controlled materials and a preference rating by applying to the WPB on Form CMP-4B, but, if he does so, he must use that method exclusively and may not use a customers rating or symbol."

This means that a contractor doing repair work may estimate his needs for materials he will use in repair jobs and apply for this quantity of materials on CMP-4B. If WPB approves the application, the contractor will get a rating which will get the amount of materials. Then as repair jobs come in, the contractor takes sheets out of his own inventory and doesn't have to worry about ratings.

If the quantity required as estimated falls short of meeting the contractor's needs in a given quarter he can file a supplementary application for more sheets.

What is not yet clear is—does the contractor get the requested quantity of sheets through a jobber or direct from a mill. Presumably, if he buys in mill quantities, he will get delivery from the mill. If he is a small buyer, he probably shouldn't fool with CMP-4B. Probably he should use considerably more than 6,000 pounds of sheets of each classification each quarter before he tries CMP-4B.

STATE ASSOCIATIONS

DISTRICT OF COLUMBIA
Sheet Metal Cont'rs Ass'n of the District of Columbia, Inc.

FLORIDA
The Roofing & Sheet Metal Cont'rs Ass'n of Florida.

ILLINOIS
Illinois Sheet Metal Cont'rs Ass'n.

INDIANA
Sheet Metal and Warm Air Heating Cont'rs Ass'n of Indiana.

MICHIGAN
The Michigan Sheet Metal, Roofing, Heating & Air Conditioning Cont'rs Ass'n.

MISSOURI
Missouri Sheet Metal Cont'rs Ass'n.

NEBRASKA
Nebraska Sheet Metal, Roofing, Heating and Air Conditioning Cont'rs Ass'n.

NEW YORK
New York State Sheet Metal, Roofing and Air Conditioning Cont'rs Ass'n, Inc.

OHIO
Ohio Sheet Metal Cont'rs Ass'n.

PENNSYLVANIA
Sheet Metal and Roofing Cont'rs Ass'n of Pennsylvania.

NORTH CAROLINA-SOUTH CAROLINA-VIRGINIA
Tri-State Ass'n of Sheet Metal Cont'rs.

WISCONSIN
Sheet Metal Cont'rs Ass'n of Wisconsin.

LOCAL ASSOCIATIONS

CALIFORNIA

Oakland—Associated Roofing Cont'rs of East Bay Counties, Inc.
Oakland Furnace Dealers & Sheet Metal Cont'rs Ass'n.

FLORIDA

Coral Gables—Greater Miami Roofing & Sheet Metal Ass'n.
Orlando—Roofing & Sheet Metal Industries of Florida.
St. Petersburg—St. Petersburg Sheet Metal Ass'n.
Tampa—Master Sheet Metal & Roofers Ass'n.
West Palm Beach—East Coast Ass'n.

GEORGIA

Atlanta—Warm Air Heating Cont'rs Ass'n of Atlanta.

ILLINOIS

Chicago—Air Conditioning Cont'rs Alliance.
Associated Sheet Metal and Air Conditioning Cont'rs Ass'n.
Central Committee.
Furnace—Air Conditioning, Sheet Metal Institute.
Furnace & Sheet Metal Ass'n.
Roofing Contractors of Cook County and Vicinity.
Sheet Metal Cont'rs Ass'n of Cook County.
Ventilating & Air Conditioning Cont'rs Ass'n of Chicago.
Aurora-Elgin—Fox Valley Furnace & Sheet Metal Cont'rs Ass'n.
Hinsdale—Air Conditioning & Warm Air Heating Institute of Ill.
Peru—Sheet Metal Cont'rs Ass'n of LaSalle and Peru.
Rockford—Sheet Metal & Furnace Cont'rs Ass'n.
Springfield—Sheet Metal & Warm Air Heating Cont'rs Ass'n.
Sterling—Whiteside County Sheet Metal Cont'rs Ass'n.

Calling All

UNDER today's trying conditions;

And likely under the conditions following the war;

No national association can be really useful—nor can it rightly claim to represent an industry—unless that national speaks for every local and state association in the industry.

Nor can that national association be worth much to the individual member in the industry unless—and until—the problems the national seeks to solve and the suggestions it makes are precisely those problems which every individual member faces right in his own home town.

For that reason the new National Association of Sheet Metal and Allied Contractors which now is being formed earnestly desires—as quickly as possible—to bring into the national's membership as many members as possible of every local and state association which is now functioning or has functioned.

The reasons for this are simple—

1—Members of local and state associations already know how a national voice can help

2—By tieing together all local and state associations into a National organization, that National immediately speaks for the industry

3—Even a majority of the members of all local and state associations will immediately mean a working membership which can get things done

4—Many immediate and future problems require intense study and prompt action such as can

---

INDIANA

Fort Wayne—Sheet Metal, Warm Air Heating and Roofing Cont'rs Ass'n.
Gary—Gary Sheet Metal Cont'rs.
Indianapolis—Air Conditioning Council of Indianapolis.
South Bend—Master Sheet Metal and Warm Air Heating Ass'n.

IOWA

Fort Dodge—Ft. Dodge Sheet Metal Cont'rs Ass'n.
Sioux City—Sioux City Warm Air Heating Ass'n.

LOUISIANA

New Orleans—Sheet Metal Ass'n, Inc.
Shreveport—Shreveport Sheet Metal Cont'rs.

MARYLAND

Baltimore—Sheet Metal & Roofing Cont'rs Ass'n.

MASSACHUSETTS

Boston—Associated Ventilation, Sheet Metal Cont'rs of Boston.
The Master Sheet Metal Workers and Roofers Ass'n.

MICHIGAN

Battle Creek—The Heating and Air Conditioning Cont'rs Ass'n.
Detroit—The Detroit Ass'n of Warm Air Heating & Air Conditioning Cont'rs, Inc.
Flint—Warm Air Heating & Sheet Metal Cont'rs of Flint.
Grand Rapids—The Sheet Metal Ass'n.

Ass'n Members

come only from already organized groups.

In addition, the new National association solicitates the membership of every individual contractor—warm air heating dealer, sheet metal contractor, roofer and all allied industries.

The objectives of the new National association were stated in the June issue of this publication. They are—

1—to get proper recognition for this industry in Washington

2—to interpret and advise on government regulations affecting this industry

3—to maintain proper standards of industry practice

4—to prevent post-war encroachment by others

There are other things needing attention; there will be many more problems as time goes on.

The cooperation—and the membership—of every contractor in this industry is needed. If you belong to an association, ask that some action be taken. If your association is vacationing for the summer or has been inactive for some time—this cause is worth getting together over. If you belong to no association, talk it over with the other members of the industry in your community.

Then—and as soon as possible—send your questions, your suggestions, your financial help, to either of the temporary officers below.

Chairman, W. J. Perkinson
412 N. Wolcott, Chicago

Secretary, C. J. Meyer
567 Genesee, Buffalo, N. Y.

Jackson—The Jackson Sheet Metal and Roofing Contractors' Ass'n.
Kalamazoo—Sheet Metal, Roofing, Heating & Air Conditioning Cont'rs.
Pontiac—Pontiac Warm Air Heating, Sheet Metal & Roofing Cont'rs Ass'n.
Saginaw—Saginaw Valley Sheet Metal, Roofing, Heating, Air Conditioning Cont'rs Ass'n.

MINNESOTA

Minneapolis—Minneapolis Sheet Metal Heating & Air Conditioning Ass'n.
St. Paul—St. Paul Sheet Metal and Roofing Cont'rs Ass'n.

MISSOURI

Kansas City—National Air Conditioning Ass'n.
Sheet Metal and Heating Cont'rs Ass'n.
St. Louis—Associated Sheet Metal, Air Conditioning and Warm Air Heating Ass'n of St. Louis, Inc.
St. Louis Jobbers Ass'n.
St. Louis Heating and Sheet Metal Wholesalers Ass'n.

NEBRASKA

Omaha—Omaha Air Conditioning Council.

NEW JERSEY

Newark—Air Conditioners Ass'n of New Jersey.
Associated Roofing & Sheet Metal Cont'rs of N. J.

NEW YORK

Albany—Capitol District Roofing & Sheet Metal Cont'rs Ass'n.
Brooklyn—Kings & Queens Counties Roofers & Sheet Metal Cont'rs Ass'n.
Buffalo—Buffalo Sheet Metal, Warm Air Heating & Air Conditioning Ass'n.
The Merchandisers Ass'n Auxiliary to New York State.
Gloversville—Fulton-County Sheet Metal, Warm Air Heating & Roofing Cont'rs Ass'n.
New York—Employers' Ass'n of Roofers and Sheet Metal Workers of Greater New York, Inc.
Roofing and Sheet Metal Crafts Institute, Inc.
Rochester—Master Sheet Metal, Furnace and Roofers' Ass'n of Rochester.
Syracuse—Syracuse Sheet Metal Cont'rs Ass'n.
Utica—Utica Sheet Metal Cont'rs and Roofers Ass'n.
Woodside—Queens Roofing, Sheet Metal and Residing Cont'rs Ass'n.

NORTH CAROLINA

Charlotte—Ass'n of Sheet Metal Workers.

OHIO

Akron—Warm Air Heating, Sheet Metal and Roofing Ass'n of Akron.
Canton—Furnace and Sheet Metal Cont'rs Ass'n of Canton.
Cincinnati—Cincinnati Warm Air Heating Ass'n.
Cleveland—Warm Air Furnace and Air Conditioning League.
Columbus—Sheet Metal Cont'rs Ass'n of Columbus.
Dayton—Sheet Metal, Furnace & Roofing Cont'rs Ass'n, Inc.
Mt. Vernon—Knox County Sheet Metal Cont'rs Ass'n.
Springfield—Master Sheet Metal Workers' Ass'n of Springfield.
Toledo—Toledo Sheet Metal and Roofing Cont'rs Ass'n, Inc.

PENNSYLVANIA

Erie—Sheet Metal Cont'rs Ass'n of Erie.
Monaca—Beaver Valley Sheet Metal Cont'rs Ass'n.
Oakmont—Distributors' and Salesmen's Auxiliary of the Sheet Metal Cont'rs Ass'n of Pennsylvania.
Philadelphia—Roofing, Metal and Heating Engineers, Inc.
Pittsburgh—Sheet Metal and Roofing Cont'rs Ass'n of Pittsburgh.
Western Pennsylvania Ass'n of Warm Air Heating and Air Conditioning Distributors.
Reading—Sheet Metal & Roofers Ass'n of Reading.

SOUTH DAKOTA

Sioux Falls—Sioux Falls Warm Air Heating and Air Conditioning Ass'n.

TENNESSEE

Chattanooga—Chattanooga Subcontractors Ass'n.

TEXAS

Austin—Austin Sheet Metal & Roofing Cont'rs Ass'n.
San Antonio—San Antonio Sheet Metal & Roofing Cont'rs Ass'n.

UTAH

Ogden—Ogden Sheet Metal Cont'rs Ass'n.
Salt Lake City—Sheet Metal & Warm Air Heating Cont'rs Ass'n of SLC.

WASHINGTON

Seattle—Promoting an association of Heating & Air Conditioning Contractors.

WISCONSIN

LaCrosse—LaCrosse Sheet Metal & Air Conditioning Cont'rs Ass'n.
Milwaukee—Milwaukee Sheet Metal Cont'rs Ass'n, Inc.
Oshkosh—Oshkosh Sheet Metal Cont'rs Ass'n.
Racine—Racine Sheet Metal Cont'rs Ass'n.

Interpretations, Amendments, Easements To Existing Orders

More Jobbers Exempted—L-63

SEVERAL thousand small wholesale, and retail suppliers have been eliminated from restriction of Order L-63 (Supplier's Inventory Limitation) with amendment of the order by the War Production Board, effective June 10.

Henceforth, all suppliers whose total inventory at cost is less than $35,000 are exempt from provisions of the order. The previous exemption covered all suppliers with inventories costing less than $20,000.

Other changes made by the amended order are:

1. The amount of inventory which a distributor can carry is determined by the state rather than by the time zone in which the distributor is located. Inventories of suppliers located in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas are subject to the limitation based on four months' sales, while those in all other states and in the District of Columbia are restricted to three months' inventories based on the previous three months' sales.
2. Definition of "direct shipments"—which are exempt from the order in determination of sales—is clarified. Such sales include all those in which the goods go directly from the producer to the supplier's customer.
3. The definition of supplies is also restated to make it clear that the specified items covered by L-63 are subject to the order's restriction even though they may be consumers' goods also subject to coverage of Order L-219 (Consumers' Goods Inventory Limitation).
4. Lines of seasonal goods are now permitted to be stocked beyond a distributor's permissible inventory limits during a period not to exceed 120 days. Previously, this exemption from the order was allowed only if the period during which the goods were stocked did not exceed 90 days.

◆

Oil Burner Stock Control (L-74)

TO RESTRICT further the manufacture and secure more equitable allocation and freer distribution (especially to the Armed Forces) of existing stocks of oil burners, the War Production Board issued Limitation Order L-74 as amended, effective June 28.

A survey reveals that there are in dealers' and manufacturers' stocks, about 55,000 Class B burners enough to supply a two-year demand at present rates. The Armed Forces have required quantities of these burners, but have not always been able to locate sources of supply and thus have been forced to order them manufactured and use up materials which might otherwise have been conserved.

It is the purpose of L-74, as amended, to have all orders for Class B burners routed through the Plumbing and Heating Division of WPB hereafter so that prospective purchasers can be directed to available supplies. The division has estimated that some 30,000 Class B burners will be required for military and civilian use in the next 12 months. No estimate has been made of the requirements for other burners.

Under the amended order, burners are divided into three classes. Class A comprises those burners which use No. 5, 6 or heavier fuel oil, or which are designed specifically for shipboard use or for heat processing. Class B comprises those burners which use Nos. 1, 2, 3, or 4 fuel oil except a Class C burner which is pot type vaporizing burner using No. 1 fuel oil exclusively.

An approved order for a Class A or C burner is one authorized under a construction order or for the account of a claimant agency. All orders for Class A or C burners for other end uses and all Class B burners must be approved on Form WPB 2727.

The order prohibits placement of an order for any oil burner to be used in an area restricted by Order L-56 or any order issued by the Petroleum Administrator for War, unless such order be accompanied by a copy of an authorization from PAW permitting the delivery of oil for such burner.

This order will affect the entire oil burner manufacturing industry which is composed of some 191 manufacturers, of which about 20 are still manufacturing burners.

There are two WPB orders which have direct bearing on this amended order. Limitation Order L-79 restricted delivery of oil burners to ultimate consumers, except on orders bearing a preference rating of A-10 or higher. L-79 has now been amended to remove oil burners from its restrictions. Limitation Order L-56 prohibits the delivery of fuel oil to new installations of oil burners unless approval has been obtained from PAW.

◆

A.C. Repair Under MRO

PURCHASE orders for maintenance and repair parts for industrial and commercial refrigerating and air conditioning equipment must bear preference ratings of AA-5 or higher according to Limitation Order L-38 as amended May 28 by the War Production Board.

The rating previously required was AA-4 or higher. The present change is made to bring L-38 in line with the minimum preference ratings for repair and maintenance parts established by CMP Regulation No. 5 as amended May 14, 1943.

◆

Changes in Steel Orders

SEVERAL technical changes in regulations and orders affecting the steel industry were announced July 5 by the War Production Board.

These actions are as follows:

1. Order M-21-c, which scheduled steel plate production, was revoked, its function now being supplanted by the controlled materials plan.

2. Order M-21-d, covering corrosion and heat resistant chrome steel, was amended to permit the use of stainless steel on authorized controlled material orders. Previously, the use of stainless steel was permitted only on AA-5 or higher rated orders.

3. An interpretation of Priorities Regulation No. 1 makes it clear that production directives are not to be interfered with by rated orders for the use of facilities.

4. Steel mills may not establish consigned stocks in the plants of their customers under the permission granted in Direction 15 to CMP Reg. No. 1 for the maintenance of mill stocks. This is stipulated in an amendment to the Direction, issued because the original Direction has been too broadly interpreted by certain mills.

◆

Lead Eased—M-38

GOVERNMENT wartime controls over the use of lead, the one common metal available in sufficient quantities not only to fill all military and essential civilian requirements but also to be used in place of critical materials, have been further relaxed through issuance by WPB of a revised General Preference Order M-38 on May 26, 1943.

The only restrictions on use are contained in a short list of prohibited items, all considered non-essential by WPB. Restrictions on roofing and weight of flashing and waterproofing are removed and these items are now completely unrestricted.

PART 984—LEAD

[General Preference Order M-38 as Amended May 26, 1943]

Section 984.1 *General Preference Order M-38*, is hereby amended to read as follows:

(e) *Prohibited uses of lead.* No person shall use lead or lead base alloy in the manufacture of any item on List A of this order or in the manufacture of any component material or part of such item, or for any purpose specified on List A.

LIST A

(1) Automobile body solder (except for repair purposes).

(3) Building supplies as follows (except as a coating material):

(a) Gutters and leaders for residential buildings under three stories in height.

(b) Ornamental work.

(c) Puttyless frames.

◆

Fans, Blowers Need AA-5 (L-280)

ORDER L-280 on fans and blowers was amended June 21, 1943, as follows:

(b) *Restrictions on acceptance of orders for, and delivery of fans and blowers.* (1) No manufacturer or dealer shall accept any order for any fan or blower, or parts thereof, or deliver any such order unless it is rated AA-5 or higher.

(2) The limitations and restrictions of paragraph (b) (1) above shall not apply to any order for repair parts (i) in an amount not exceeding $500 for any single fan or blower, or 50% of the original sales price of the fan or blower to be repaired, whichever is less in any particular case; or (ii) in any amount, for the repair of a fan or blower when there has been an actual breakdown or suspension of operations thereof because of damage, wear and tear, destruction or failure of parts or the like, and the essential repair and maintenance parts are not otherwise available.

(3) [Revoked June 21, 1943.]

(4) No manufacturer shall accept any order for a fan or blower if he knows or has reasonable cause to believe that he will be unable to make delivery on or before the delivery date specified in the order. Any order received by a manufacturer, specifying a delivery date which the manufacturer knows or has reasonable cause to believe he will be unable to meet, shall be returned by the manufacturer to the proposed purchaser within twenty days after the receipt thereof.

(5) The limitations and restrictions of this paragraph (b) shall not apply to the acceptance by a dealer of any order for centrifugal type air booster, furnace fan, or underfire coal burning fans having a capacity of 2500 CFM and less, with motors of ¼ HP and less, to be delivered for use on or in connection with a furnace.

◆

Welding Rod Is Not MRO

WELDING rod used for manufacturing purposes may not be treated as an operating supply under CMP, the War Production Board announces, even though it is carried as an operating supply under the manufacturer's established accounting practice.

This ruling is contained in Direction No. 7 to CMP Regulation No. 5, which says that welding rod includes both arc welding electrodes and gas welding rods.

The Direction states that a manufacturer may use ratings assigned to him by CMP Regulation No. 5 for MRO, to obtain his requirements of such rod to repair his own equipment. However, such ratings may not be used to get welding rod for welding operations in the production of a product.

◆

Unused P-55's Recalled

UNUSED priorities for war housing projects, which have tied up critical material available for this purpose, will be recovered and reallocated to builders who are prepared to go ahead with construction, it is announced by the War Production Board and the National Housing Agency.

To this end, the War Production Board has issued an order revoking all outstanding P-55 preference rating orders except those which qualify under the Controlled Materials Plan. The revocation will become effective on the expiration date of the P-55 order, or on July 15, 1943, whichever is later.

The revocation order applies to war housing preference rating orders issued under earlier priorities procedures, where the builder has not taken steps to qualify his project under CMP procedures. Issuance of P-55 orders was discontinued April 1, 1943.

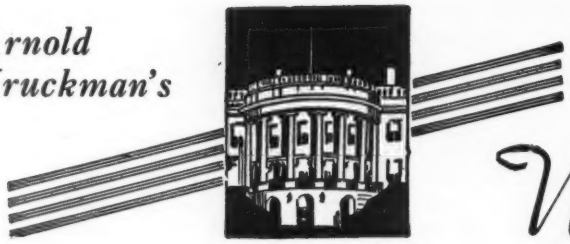
The new order does not affect outstanding P-55-b preference rating orders, the authorization issued under current war housing procedures. It also does not affect builders whose structures are authorized on CMP-4-C or CMP-H-1 forms.

If a builder holding a P-55 order files a CMP-H-1 form, requesting the National Housing Agency to allot controlled materials, before expiration of his P-55 or July 15 (whichever date is later), the revocation order will not take effect unless the CMP-H-1 application is denied. If denied, the revocation order then takes effect immediately.

A builder holding an expired P-55 order which has

(*Continued on page 98*)

Arnold Kruckman's



Washington Letter

The Fuel Situation

DAVE LAWRENCE, the columnist, recently told us we have a food scarcity amidst plenty. The fuel situation is the same, according to WPB. We have plenty of oil, but the storage stocks are low. We have plenty of coal, but much of it is in the ground. We have abundant wood, but it has not been cut down. This condition would not trouble us if we were not at war. But with war, our transportation facilities are overloaded and unbalanced and our manpower is unbalanced and the distribution of our fuel is out of balance. It is not possible to discuss the important phases of the situation frankly because such discussion would trespass upon the necessary hush-hush involved in war. But it is proper to note that there is some difference of opinion among the people of the various war agencies about the distribution of our fuel.

They tell you here that fuel is second to food in importance at this time. As a matter of fact it holds exactly the same position in this present confusing war economy. The situation is the same in relation to its incidence to the many war agencies, and to the overlapping of interest and authority of the agencies. The sense of conflict you feel is not due to any lack of skill, ability, sincerity, or patriotism in the agencies or the men and women who do the work of the agencies, but apparently it heads up to the same lack of clarified precise authority and power that exists in the food field.

Centralized Authority Lacking

Why this precision is lacking you can determine as well as we can here in Washington. The gentlemen in the OWI will tell you it is an inevitable concommitant of the emergency conditions of war; others will tell you it is inseparable from the operation of a democratic government. A gentleman in OCR, who has struggled with the fuel problem for many months, says the reason is the same reason why Chester C. Davis quit the Food Administration: it is almost impossible to find the ultimate source where policies are made.

But never forget most of these people in Washington are just as patriotic as you are and are just as eager to do things right as you want them done. Their own problems, part of the whole problem, are so large, so engrossing, so absorbing , and so troublesome, that they lose perspective. And they seldom glimpse the problem as a whole because their vision is undoubtedly distorted by some part of all the reasons marshalled above.

It is easy to throw brickbats and to get peevish over things when your comfort and your welfare is jeopardized, and when your business is demoralized; and you are justified to feel as you do feel. But do not utterly blame the thousands of workers in Government who probably feel much as you do and who work day and night and Sunday and holidays to keep things moving. Very few of them actually are to blame for anything you suffer. Despite the fact that so many things are awry and askew, things are getting done. Whether things go ahead in spite of the situation that prompted Chester Davis to quit, or whether there is a virtue in that condition we cannot understand, and we go ahead despite all misunderstanding is something each man probably must determine for himself. The big fact is that we go ahead.

And in the large sense it seems certain things shake down to a working basis after the turmoil and chaos have been resolved into a recognizable pattern. We have seen that happen here time after time. Usually the force behind the effect is greater than any one man. In Europe and in Asia it seems to be the result of the program made by a few men. Here it appears to be some collective power that comes through the people.

Too Many Cooks

All this moralizing may seem far afield from the problem of fuel. It is given to you because it seems to fit the situation as we see it here at this moment. Your letters to Congress and to Government officials and to us reporters reveal you get just as blue and skeptical as we do. Possibly these thoughts may reassure you in the same way that they reassure us. It is for this reason we feel the current confusion in the fuel situation is a passing phase. We even think we can discern the glimmer of adjustment and order.

Many agencies have to do with fuel. In the front are Army, Navy, Lend-Lease, BEW, and then come PAW, OPA, Solid Fuel Administration, Bituminous Coal Consumers' Council, Conservation Division of WPB, OCD of WPB, SWPC, ODT, WMC, WLB, NHA, FHA, and other agencies whose alphabetical medley would chiefly confuse you. We are told here our present desperate need for conservation is chiefly due to the manner in which Army, Navy, Lend-Lease and BEW have pre-empted fuel. The armed services logically have appropriated great reserves for their needs. It is neither profitable nor proper here to go into the validity of the need for maintenance of the great stockpiles. It appeals to our common sense that each campaign creates a need for more fuel.

The importance of fuel is emphasized in a WPB release which states that "petroleum products account for fully two-thirds of the total tonnage of supplies necessary to support an expeditionary force, and keep its mechanized equipment in operation." Ickes has

said: "If it were possible to tell you just how much fuel will be needed to carry out the tremendous allied offensives planned for 1943 you would readily understand our failure to be optimistic about civilian supplies. Doubling or trebling the amount of oil shipped across the seas will result in a great deficiency in civilian oil stocks." WPB hammers hard on the fact that supplies which may be available in the Near East, along the Mediterranean, have long been earmarked for special purposes. This means, obviously, we must supply fuel for the European campaigns. It is simple sense to realize we must supply huge quantities of fuel for the Pacific campaigns. Apparently fuel in its application to the war in Europe means coal as well as oil.

Fuel Stockpiles All Over World

You have noticed that Lend-Lease and BEW are among the foremost agencies handling fuel. We know fairly well that there has been over 11,000 per cent increase in the motorization in this war, compared to the last war. But we may understand more clearly the problem of fuel when we read in an OPA circular that *"we are stocking England and dozens of naval and military bases all over the world* to build up reserves for any possible future activity." Undoubtedly our fuel is going to all the continents of earth, as well as to its islands. BEW sent some of our petroleum to Spain to run the Spanish busses. We have much detailed knowledge which has been widely published about the food Lend-Lease has sent broadcast over the world, and about the drugs and chemicals and commodities other agencies have sown around the world for strategic reasons. But we have rarely become aware how great a role our fuel has played in the indirect as well as direct business of this war.

Some Say—"Civilians Should Come First"

This use of the fuel is another debatable question about which there is much disagreement among some officials in Washington. There are some who believe our domestic needs should come first after the direct and immediate needs of the armed services, and that the indirect war needs should follow our own domestic needs. This same school does not agree with national distribution of fuels, but believes that fuel should be allocated in volume and kind on a regional basis. They believe that coal should be used where coal will eliminate cross-hauls, and that oil will be available where the homes are equipped to use it. They would have no conversion south of Hatteras, and they would be chary of conversion everywhere. It is their doctrine that wood should be used in the Pacific Northwest which is habituated to wood and sawdust.

These officials tell you they know there is enough coal and petroleum to meet our domestic needs well into 1944 if curtailment is practised to prevent hoarding by Government as well as by citizens, and if measures are taken to stop interruptions of supply. They feel there should be "some check on the inordinate demands of the military and other non-civilian agencies," and they define the demands of Lend-Lease and BEW as illogical. They feel that conversion in all areas should be selective; that it is a waste to convert in many areas. They have fought coal rationing, and would avoid rationing of any fuel whenever and wherever rationing may be bypassed. Their principle is to control distribution and to maintain the volume without reduction in supply.

It is this group which holds there should be more trucks for the fuel distributor, wholesale and retail; and that transport by rail and inland water should be balanced in delivering the fuel essential for civilian needs with the demands by military and non-civilian needs. Their premise is based fundamentally on the assumption that there is enough fuel for military and civilian needs, that these requirements should be met before non-American foreign needs are supplied, and that there is little need for conversion of facilities, and less need for conservation. The repeated insistence is that this result be accomplished by *controlled distribution.*

Fuel Needs More Labor

All this obviously implies more help, more workers, more manpower in production and in distribution of fuel. It means more stability in the uninterrupted production of coal and wood and other fuel. The people of this school believe there should be more men available to drive the coal delivery trucks, and that Government regulations should provide the means to secure the help that will shovel the coal into the home-cellar. There is authentic public information now that our Army has reached a total in excess of 7,000,000 men. Here in the Capital they feel that the armed forces have come to the conclusion they can cease expansion with less than another million men and women. If this is true the theory is that more manpower will readily be at hand for such services as the production and distribution of fuel.

There are in existence committees that function to bring together representatives of agencies having direct business with production and control and use of fuel. But these interdepartmental and intra-departmental committees are limited in scope. Apparently they do not grapple in the largest sense with the over-all implications of fuel. There does not seem to be an active functional liaison body in Government that coordinates the purposes and plans of all agencies engaged in the multiple applications of the use of fuel. The OWI thinks it is acting as such a unit, but in reality it is operating solely as the clearing house for routine information, gathered from the various interested agencies, which it assembles, organizes, and feeds to the press and the radio to implement a series of campaigns to induce civilians to conserve fuel, and to buy fuel early, as well as to practice various measures of conservation in order to curtail the consumption of fuel.

OCR May Rescue Civilians

The Office of Civilian Requirements is increasingly gaining stature and influence to accomplish the results that would be necessary to make such over-all team-play effective. There has been much hesitation in Washington to accept OCR as an active and realistic institution geared genuinely to help civilian industry and to serve the civilian economy. The word is that another underground effort is under way to unhorse Donald Nelson. But Nelson seems to be fully determined to maintain his place and to sustain OCR as an effective unit for civilian service *within* WPB. The last week in June he spent days in personally visiting every unit chief of the many sections in the numerous bureaus and divisions of WPB. He not only personally became acquainted with these men and women, and acquired an illuminating knowledge of their individualities and the details of their work, but he inspired them with a sense of leadership and intimate interest

(*Continued on page* 93)

OPA—RPS 49—Sheet Price Ceiling

DOLLARS-and-cents ceiling prices for prime quality heavy steel products sold by heavy line steel warehouses in six newly-created pricing zones were announced June 11 by the Office of Price Administration.

The new zones, with the specific dollars-and-cents ceilings, are established in Amendment No. 16 to Revised Price Schedule No. 49 (Resale of Iron and Steel Products), and become effective June 21, 1943.

The six new zones provide specific prices for 18 States and parts of 5 others in the East Central, Central, and Western regions of the nation—a territory flanked by the New England States on the East, the Southern States on the South, and the Far Western States on the West. In the territory covered by the six zones are centered the bulk of the country's steel producing mills, distributing warehouses, and heavy steel consuming industries.

The new zones are as follows:

Zone 5. Thirty-eight counties in New York State, 30 counties in Pennsylvania, 2 counties in Maryland, 18 counties in Virginia, the entire States of West Virginia, Kentucky, and Ohio, 49 counties in Indiana, and 43 counties in Michigan.

Zone 6. The entire State of Illinois except the cities of Brooklyn, East St. Louis, Granite City, Madison, Monsanto and Venice; 62 counties in Wisconsin, 50 in Missouri, 12 in Nebraska 13 in Minnesota, the entire State of Iowa except the Metropolitan area of Council Bluffs, 14 counties in North Dakota, 53 counties in South Dakota, 40 counties in Michigan, 43 in Indiana, and the entire States of Montana, Wyoming, Arkansas, Oklahoma, and Kansas.

Zone 7. Seventy-four counties in Minnesota, 39 in North Dakota, 16 in South Dakota, and 9 in Wisconsin.

Zone 8. Sixty-five counties in Missouri and the following cities in Illinois: Brooklyn, East St. Louis, Granite City, Madison, Monsanto and Venice.

Zone 9. Eighty-one counties in Nebraska, also the Metropolitan area of Council Bluffs, Iowa.

Zone 10. The entire State of Colorado.

Eventually the entire nation will be contained in zones for the pricing of steel products sold by warehouses. Zones 1, 2, 3 and 4 were established April 15, 1943, providing dollars-and-cents ceilings for warehousemen along the Eastern Seaboard, and covering States from Maine to North Carolina. Zones with prices for the Southern and Pacific Coast States—the only ones now unzoned—are being drawn, and will be issued at a future date.

Calculation of Less-Than-Carload Ceiling Prices

"In calculating less-than-carload ceiling prices the seller refers to the 'zone price component index' for each zone," OPA said. This index specifies the different factors that, added together, give the zone destination price. These factors are:

1. Name of Product
2. Basing Point (A)
3. Price at Basing Point (B)
4. Freight (C)
5. Spread (D)
6. Quantity differentials (E)
7. Quality and merchandising extras (F)
8. Size Extras (G)
9. Cutting Extras (H)
10. Miscellaneous Extras (K)

Of these factors, the tables accompanying the zone price component index list all but two in dollars-and-cents; the ones not in dollars and cents are price at basing point and freight.

Calculation of Freight

"The calculation of freight (item C in the zone price component index) differs slightly within five of the six new zones," OPA said. "In Zone 6 the freight charge is determined exactly as in Zones 1 and 4, previously established; that is, less-than-carload freight from the governing basing point to the customer's destination. In Zone 5, the freight charge is also determined in the same manner, except that provision is made for maximum freight absorption. In Zones 7 to 10, the freight is determined somewhat differently in order to reflect trade practices in effect in those areas on the ceiling date, April 16, 1941.

"Within Zone 5, as in Zones 1 to 4, the seller uses the less-than-carload freight from the governing basing point to the customer's destination. However, an alternative is provided in cases of unusual freight absorption. Thus, if the seller wishes, he may compare less-than-carload freight from the governing basing point to the customer's destination with the sum of less-than-carload freight from the governing basing point to his own shipping point and less-than-carload freight from shipping point to the destination. Where the sum of the latter two exceeds the former by more than $0.30 per 100 pounds, the seller is permitted to use as the freight charge that sum less a deduction of $0.30 per 100 pounds. In other words, a seller need not absorb freight within Zone 5 beyond $0.30 per 100 pounds. Similarly, where there are two governing basing points to be used, one for the destination and another for the shipping point and the prices at both basing points are different, the seller should compare the zone destination price with the sum of the zone shipping point price plus less-than-carload freight from shipping point to destination, in order to determine whether a freight absorption of more than $0.30 per 100 pounds is required.

"This $0.30 maximum freight absorption arose from the fact that, because of the numerous mill basing points influencing prices within the zone and the smaller spreads prevailing in it, the sellers rarely made shipments to those parts of the zone requiring considerable freight absorption. This is particularly true for those shipments requiring back-hauls in the direction of basing points," O. P. A. added. "However, today, because of distribution of steel under directive of the War Production Board to War and to essential plants, shipments requiring considerable freight absorption are being made almost daily. Special provision is made in the Amendment, accordingly, for maximum freight absorption in Zone 5.

"Further, within Zone 5, there is a second freight option applicable to shipments beyond a seller's normal market area where use of motor truck is required and where the truck rate exceeds the less-than-carload rail rate. This provision is similar to that established for all such shipments in Amendment No. 15.

(*Continued on page 92*)

This Year You Should Get and Study a

Monthly Profit and Loss Statement

By Arthur Roberts

IN 1941, I poled 78 warm air heating dealers and sheet metal contractors and found that only 7 or 9 per cent prepared profit and loss statements monthly, and but 4 in the group analyzed these statements after they got them. Investigation this year discloses that this "knock" in the business engine has grown worse instead of better because only 2 per cent of those queried are cognizant of a big change that the war has brought to profit and loss statement analysis for all merchandisers.

Two phases of the problem must be considered today: (1) Our war economy is distorting the normal business routine so that the dealer or contractor must analyze his profit and loss statement monthly to appraise negative results and apply correctives, if need be, in the shortest possible time. To wait for quarterly, semi-annual or annual statements these days is inviting a business blitz; (2) Many old yardsticks used in analyzing statements are "out" for the duration and postwar period, so even those who analyze their statements monthly will make a bad job of it unless they revise this method of analysis.

Net Profit

Formerly, the only figure the dealer or contractor scrutinized was the net profit. This was his measurement of operating efficiency. If it showed a good return on his investment and the ratio to sales was passable, he assumed he had done an efficient managerial job. He could figure on crediting a substantial part of the net profit to net worth because the tax of former years took only a modest portion. Now, the income tax cuts so deeply into earnings that he can no longer place as much reliance in the net profit as a yardstick of efficiency because, after the tax is deducted, the net will be substantially reduced. "Taxable profit" would be a better term for the difference between sales and over-all costs. The net profit is really what is left after the Federal tax is deducted.

In days before Pearl Harbor, the dealer or contractor never considered his income tax until March 15, then entered it when paid, quarterly or annually, as a charge against net worth because the Federal tax cannot be deducted from income on the income tax return. The safe procedure today is to estimate the tax for the current year and pro-rate it monthly, deducting from the monthly net profit to get the right perspective on operations.

Operating Ratios on Sales

Formerly, the dealer or contractor compared his operating performance against the average figures from outside sources and against his own experience figures. The former source is no longer reliable, except to appraise the difference between ratios and operating performance before the war and today. Experience figures should be considered only for the past 3 months and then all restrictions interfering with normal operation should be taken into calculation. If a margin of 40 per cent on sales or an overhead of 35 per cent on sales produced a net profit of 5 per cent in 1941, this is no assurance that these experience ratios will give the same result today because taxes and war restrictions compell the scrapping of these old yardsticks, which were dependable enough in peacetime to use as check-figures against current results, but no longer. Suggestions as to safe operating ratios are not obtainable anywhere today because there is no stability. You must use your business wit to clear the hurdles, but you can't do a competent job unless you keep the figures under your fingers continuously.

Budgeting

In pre-war years, budgeting operations for a forthcoming period was wise business practice. Income tax was never taken into consideration. Now, tax is a major expense and should be included in the budgetary figures. Then, too, estimates should not be planned for more than 2 months in advance. Too much instability today. Even a 2-month budget will require adjustment. However, it pays to budget, because budgeting is planning, but adjust this essential to war conditions.

Overhead Expense

Because of the high tax, consider the net cost of outlay after the tax is deducted to appraise value received. An odd way to figure, you say. Brother, you'll have to revise a lot of your figures and opinions to ride the duration and postwar period safely. Take an outlay for selling for example. If your net taxable income under the 1942 rates is $5,000, the net cost of $50 worth of selling would be approximately $40. If you didn't spend the $50 for selling you would have to pay the differential in tax. A taxpayer with $15,000 net taxable income who spent $500 for sales would get it for about $350.

This also applies to manufacturers selling the warm air heating and sheet metal, contracting field. Under the high rates, the cost of sales is greatly reduced. Incidentally, those who have discontinued selling because of the war, should remember that British business men are finding it profitable to advertise right through the blitzes. Other expenses may be regarded in a similar light, particularly those outlays that keep property in tiptop condition and help promote the prestige and pocket-profit of a business.

Carry-over, Carry-back Loss

These important amendments to the Internal Revenue Code demand consideration throughout the year in connection with profit and loss statement analysis.

(*Continued on page* 90)

On Our Industry's Front

EMPLOYERS TAX CALENDAR

JULY 1—Discontinue present 5% Victory tax deduction. Withhold specified amounts from wages and salaries paid.

JULY 31—File return and pay amounts of Victory tax withheld during April, May and June.

OCTOBER 31—File return covering amounts withheld from wages and salaries during July, August and September and pay amount collected.

JANUARY 31—File return and pay government amounts withheld during October, November and December.

Furnish receipts to employees showing wages paid during 1943 and the amount of taxes withheld.

FHA New House Inspection

FIELD offices of the Federal Housing Administration will make compliance inspections of privately financed war housing built under War Production Board priorities applied for on or after February 10, 1943, the National Housing Agency announces.

The purpose of the inspections will be to determine conformity of the construction with WPB and NHA regulations regarding the use of critical materials in war housing.

Under the procedure now established, FHA offices will make at least two physical inspections of each structure in a new construction project and at least one inspection of a conversion project. These inspections are intended to determine whether the construction conforms with the provisions of the approved priorities application and that the use of critical materials is in accord with the approved bill of materials for the project. The inspections also will establish whether construction is proceeding in accordance with the schedule set forth in the application for allotment of controlled materials to the project.

Apparent violations of these provisions will be reported by the FHA to the regional office of the War Production Board for the area in which the project is located. Enforcement measures will be carried out only by the WPB. If the inspections indicate that the apparent violations can be readily corrected, the builder will be given an opportunity to carry out the corrections before the compliance report is forwarded to the WPB.

Builders are required to notify the FHA office when construction of a project has started and when construction has reached the various stages requiring compliance inspections. Notification cards will be supplied them by the FHA offices.

On projects which are FHA-insured and thereby receive regular FHA construction inspections, the priority compliance inspections will be made concurrently.

◆

Petroleum Distribution Order

PETROLEUM Distribution Order No. 13, replacing the provisions of War Production Board Order L-56 dealing with limitations on delivery of fuel oil, was issued June 30.

The new Order incorporates the provisions of WPB Order L-56 (which it replaces) with three important changes:

1. Fourteen new states and that part of Florida west of the Apalachicola River have been added to the territory in which deliveries of fuel oil are prohibited for consumption in new equipment installations or installations converted to fuel oil from other fuels. With this addition the Order now covers the entire United States. Exceptions are provided for

(*Continued on page* 94)

Clarification of the Register Situation

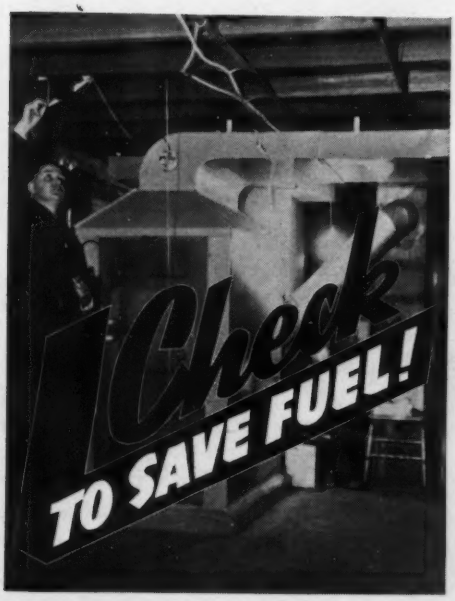
IN THE June issue, in the article "The Register and Grille Situation," certain statements were made which, we are told, caused some confusion among jobbers and dealers. The article in question may not have made it perfectly clear that production of registers is proceeding in some areas under conditions as described by the Hart & Cooley Manufacturing Co.: "We are producing registers every day. We are permitted to make registers of 'top cut' or Bessemer steel, as provided for in Order M-126, in this labor area. In addition, we were able to assemble many registers from parts on hand June 18, 1942, also as provided for in the order."

According to the June 28 list of Critical Labor Areas, as designated by the War Manpower Commission, there are other non-critical labor areas, besides Holland, Michigan, in which manufacturers of registers are located. There may also be register manufacturers in critical areas who are able to supply needs out of inventory.

In general, it would seem that the jobber or dealer can best meet the situation by ordering from his customary source of supply and, where possible, give the supplier some leeway on types and sizes or, if he must have certain types and sizes, he can try other sources of supply who may be able to fill the order without substitution.

RESIDENTIAL AIR CONDITIONING

SECTION

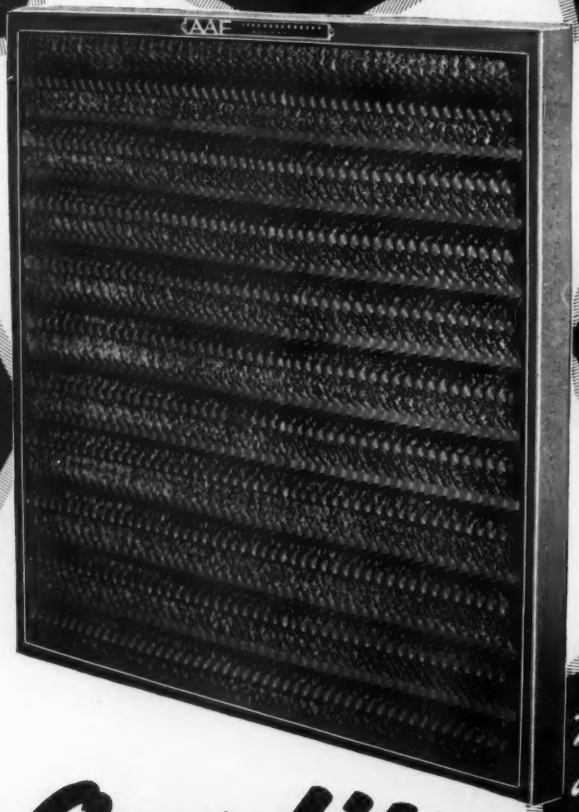


DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Cleaning Efficiency HIGHER

Dust Storage Capacity GREATER

Period of Service without attention LONGER



Resistance to air flow LESS

Cost based on life of filter LOWER

Maintenanced by washing and recoating with viscosine - costs less than 5¢

High Quality at Lowest Cost!

The outstanding advantages of the American A-C make it the most economical filter for unit air conditioners and warm air conditioning units where washable features are desirable and dust conditions are not abnormally severe.

A-C Filters are furnished in three thicknesses—1", 2" and 4". The 1" and 2" cells, without frames, are available in standard sizes and can be made to order in special sizes when necessary. The 2" and 4" are also furnished in frame units. Send for descriptive Bulletin No. 67.

AMERICAN AIR FILTERS

AMERICAN AIR FILTER COMPANY, INC., 355 Central Ave., Louisville, Ky.
In Canada: Darling Bros., Ltd.—Monteal, P. Q.

A-C Washable Type PERMANENT FILTER

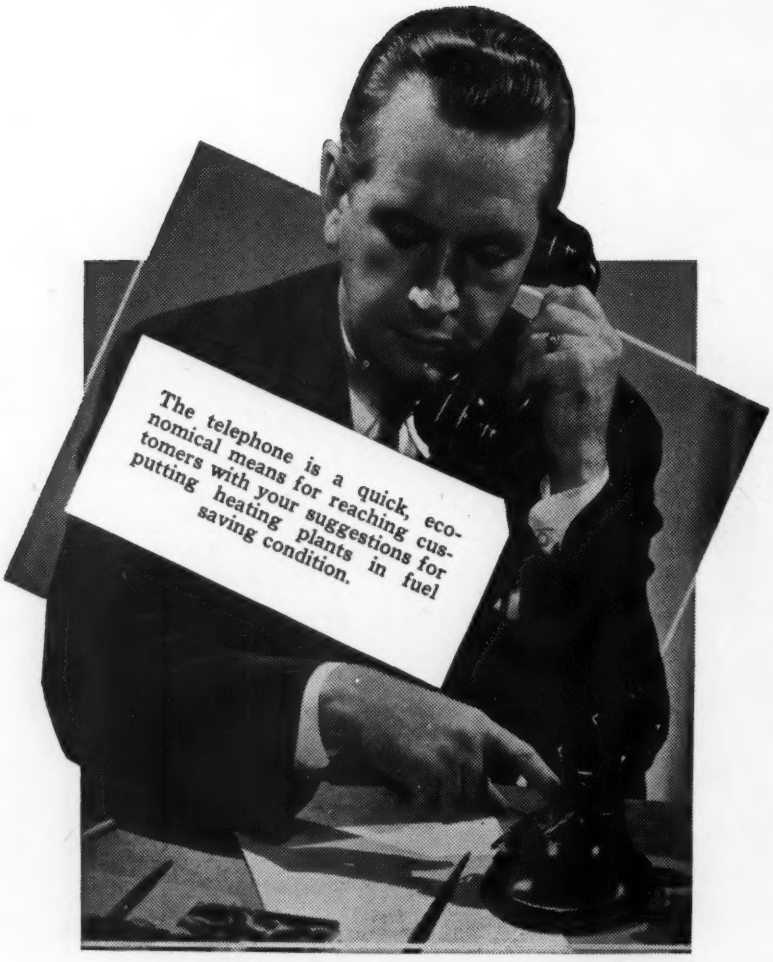
THE GREATEST CONTRIBUTION to the war effort which the warm air heating industry can possibly make — can be made during the next three months.

It is not a contribution of money or personal service.

It consists of servicing every one of the eight million central system, warm air heating plants to obtain the highest possible operating efficiency next winter.

Such a program is needed in order that fuel may be conserved next winter. That fuel must be conserved, everyone appreciates. The statistics of the situation are plainly presented on following pages. Inseparable from fuel conservation is the need for keeping existing furnaces operating through next winter so that materials which ordinarily would be furnaces can pour forth as ships, tanks, guns. Every new furnace saved by keeping an existing furnace operating can mean another ship, tank, gun in the hands of our fighting men. Government cannot keep civilians comfortable and conserve fuel and materials with words and slogans. What will do the job is a "right-down-in-the-basement" campaign by heating contractors determined to keep America healthy despite scarcities.

An outline of such a program follows.


The telephone is a quick, economical means for reaching customers with your suggestions for putting heating plants in fuel saving condition.

Here's How to Run Your Campaign

WE HAVE been told that certain Washington agencies—Office of War Information; Conservation Division of WPB; etc., have been studying the possibilities of preparing and launching a fuel conservation campaign for the summer—designed particularly for the warm air furnace industry and furnace heated homes.

But no such campaign has been forthcoming so—since the summer is hurrying along and time before next heating season starts is getting shorter and shorter—American Artisan in this issue suggests the basic details of such a program.

Readers will find one thing lacking. That is any suggestion on how to carry such a fuel conservation program to customers and home owners.

Such suggestions have purposely been omitted. We believe that each furnace dealer will know how best he can operate such a program in his area. Some may use the telephone; some may use direct mail; some may use letters to customers; some may go on the air; some may canvass house-to-house; some may advertise in newspapers.

Furthermore, we believe that thousands of warm air dealers are already—and have been for months—operating just such a campaign. First, because we consider putting furnaces in top operating efficiency for fuel conservation, to be our patriotic duty and, secondly, because we have to service if we want to keep our businesses running.

Which method should be used must be decided by the dealer, knowing how much money he can spend; whether he can hire extra help; how much extra work he can carry; what type of appeal gets the business in his home town.

Fuel Prospects For the Coming Winter

GOVERNMENT agencies and departments analysing the fuel situation report that fuel shortages can be avoided next winer only if—

1) Large consumers of fuel oil (using more than 10,000 gallons) convert their oil burners to coal burning—now.
2) Both home and industrial users of bituminous coal order their coal now and give their supplier as much leeway as possible in kind, size, quality—and store coal now.
3) Householders do everything possible now to conserve fuel —weatherstrip, storm sash, insulate.
4) Every owner of a heating plant put his system in the highest possible operating efficiency—now.

Coal

The nation's 1943 requirements for soft coal are the largest in history. For anthracite, 1943 requirements are 5 million tons more than 1942 production. To meet 1943 coal requirements—(1) coal must be mined at full capacity *every* month; (2) coal must be kept moving at the full capacity of transportation; (3) users must stockpile every possible ton, now.

There are more than 60 million users of soft coal. It heats approximately 50 per cent of all our homes. Anthracite heats more than half of all homes in the hard coal territory.

According to Solid Fuels Administration for War, we need in 1943 some 600 million tons of bituminous coal and 65 million tons of anthracite. Both all time highs in production, but—

We need 130 million tons of bituminous coal for homes, schools, etc., 10 million tons more than ever before (due to conversion); 77 million tons will be needed for homes alone. We must have this tonnage despite a critical shortage of manpower and a shortage of materials and equipment—and we can have still more work stoppages. Also a headache is transportation. Coal transportation, next winter, will require from 225 to 240 million more miles of car service than last winter. To meet this means equalized hauling every week in the year—something we never have done before. The situation of the local coal dealer is even more aggravated than that of the mine.

Oil

Petroleum Industry War Council estimates that the nation's crude oil requirements for 1943 will average approximately 3,990,000 barrels a day, and will rise to nearly 4,270,000 barrels a day in the first three months of 1944.

The real petroleum shortage of today exists in terms of low storage stocks. In the East these stocks are below dangerously low working levels. Even in the Midwest stocks are lower than before the war. In peacetime, about 95 per cent of the total oil supply to the 17 Eastern seaboard states reached there by tanker. This tanker system is today shot to pieces. Railroads and pipe lines must pinch hit for the ships. Today about 70,000 tank cars are bringing about 900,000 barrels of oil to the east coast daily. Most of these tank cars have been taken from service in other parts of the country.

The "Big Inch" pipe line, about which there has been so much publicity, is a 24-inch pipe from Longview, Texas to Norris City, Ill. It carries 300,000 barrels of oil a day to Norris City, Some 900 tank cars carry the oil from Norris City to the East. When the pipe line from Norris City to New York area is completed this August these tank cars will be released. Also, a parallel 20-inch pipe line will be completed early next year, maybe. This line will carry gasoline, kerosene and refined products.

But the capacity of this pipe line —perhaps more—can easily be required by a stepped-up "second front". Anyway it is figured, fuel oil conservation—and conversion—is highly essential.

Conclusion

All possible supply schemes seemingly fall short of the possible demand for oil and coal next winter unless users do everything possible to reduce consumption to a minimum. But the owner finds it difficult to determine what to do, beyond what gossip he hears over the back yard fence. Heating men must advise the owner. There are certain measures which we know save fuel. There are some measures which may or may not save fuel—only a heating expert can determine. On following pages these measures are reviewed.

FHA Time Payment Plan

TO assist the national drive for fuel economy, the Federal Housing Administration has established a delayed payment plan for loans insured under its Title I program which finance fuel conservation installations.

The FHA has notified the 5,000 private lending institutions authorized to operate under its Title I program that initial payments on loans made between April 20 and September 1 may be deferred until November 1, 1943, if the entire proceeds are used for the conversion of heating equipment to the use of other fuels, for application of insulation within existing structures, or for installation of storm doors, storm windows, or weatherstripping.

Under Title I, loans for heat conservation measures are available through lending institutions in amount up to $2,500 and are payable in monthly installments over as long as 36 months.

The construction involved in converting oil or gas burning furnaces to the use of other fuels or in installing inside insulation, weather-stripping, storm doors, or storm windows may be undertaken without authorization from the War Production Board.

Furnace Cleaning

PROBABLY every heating contractor appreciates that the accumulation of soot on the heating surfaces of a furnace tends to decrease the heat transmission from the hot flue gases to the circulating medium.

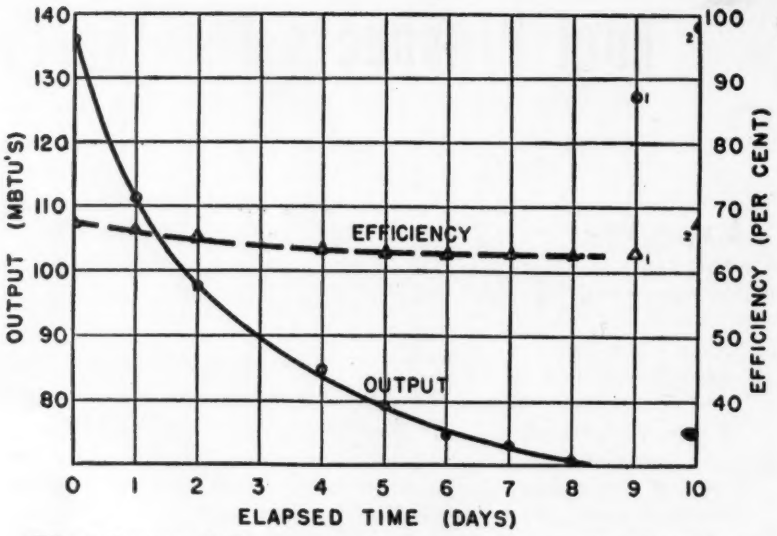
By all means, therefore, a furnace should be cleaned during the summer season when the check-up is made and, for highest efficiency, the furnace should be cleaned as many times during the heating season as is necessary to keep the soot accumulation to a minimum. The number of times a furnace will have to be cleaned will depend upon the type of fuel used, the draft in the chimney, the combusion rate, and the method of firing.

Cleaning has been advertised to home owners on the basis that a good clean furnace will reduce the fuel consumption up to 20 per cent of the amount of fuel used when the furnace is full of soot. There is no laboratory proof that such a saving can be made. Contractors, therefore, should not make claims for 20 per cent fuel reduction when the furnace is cleaned.

The tests conducted at the Bureau of Mines (report of investigation 3272) indicate that the decrease in heat transmission and efficiency caused by the soot formation on heating surfaces is destructive to highest efficiency. Says this Bureau of Mines Report:

"(1)—the test showed that in round boilers with three intermediate sections — that is a ratio of effective secondary to total heating surface of about 0.4—operated at the average rate

(*Continued on page* 98)



Effect of soot on boiler output at constant stack temperature (600° F) as reported in "Effect of Soot on the Rating of an Oil-Fired Boiler," Nat'l Bureau of Standards.

Casing Insulation

SINCE insulation can readily be obtained, it may be well for the service man to study the possibilities of obtaining greater efficiency and capacity from the furnace by insulating the casing and bonnet and by placing a liner in an unlined casing (sometimes found in old furnaces).

The results found in the Research Residence are shown graphically in the accompanying Fig. 99. Note that at average winter combustion rated (4 pounds of coal per hour per square foot of grate area) efficiency is increased about 6 per cent and capacity about 3 per cent.

Capacity-wise at 4 pound rate the increase is about 10,000 Btu per hour.

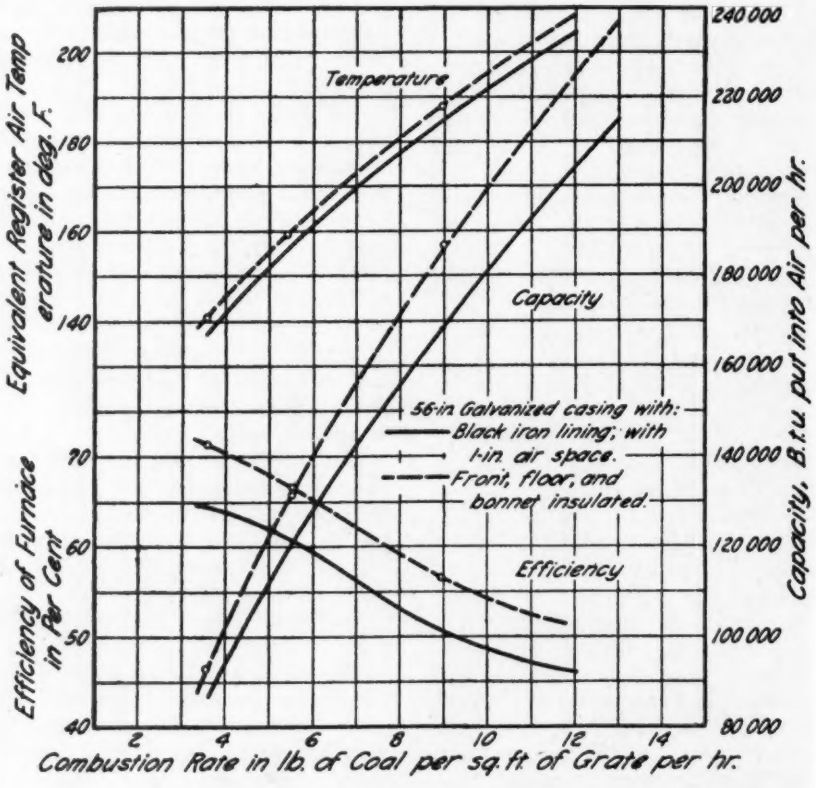


FIG. 99. PERFORMANCE OF INSULATED FURNACE

Combustion Efficiency (Coal)

COMBUSTION efficiency, whether coal, oil or gas-fired, is commonly expressed as a percentage of the heat given by the fuel as 100 minus the flue gas losses per pound of fuel, expressed as a percentage of the calorific value of one pound of fuel.

In the field, the flue gas losses at the smoke outlet of the furnace, excluding those losses resulting from unburned combustibles, can be determined by measurements of the flue gas temperatures and CO_2 content of the flue gases, and by the use of the flue gas loss tables accompanying.

The procedure for checking combustion efficiency in a coal-fired furnace consists of inserting a flue gas thermometer in the smoke pipe between the furnace and the draft adjustor and reading the temperature when a brisk fire is burning. The tube of the portable CO_2 analyzer should be inserted at the same hole used for the thermometer and a sample of the CO_2 content of the flue gases should be measured.

According to the type of coal used, refer to Tables 1 or 2 and determine and read the total loss in flue gas in per cent for the type of fuel burned.

For example, in Table 2 for anthracite coal, if the thermometer shows 500 deg. flue gas temperature and if the CO_2 reading shows 9 per cent, the intersection of these two lines gives 21.0 or 21 per cent total loss in flue gas.

Similarly, if high volatile bituminous coal is used (Table 1) and the flue gas temperature is 500 per cent and the CO_2 reading shows 9 per cent, the total loss in flue gas is 21.8 per cent.

Certainly, somewhere in the neighborhood of 50 to 60 per cent total furnace efficiency should be aimed for. Some indication as to what may be expected in a good installation is reported in the University of Illinois Circular No. 15 which shows that—"The furnace efficiency was 59 per cent and tests showed that 41 per cent of the heat of the fuel was given up from the furnace through other channels than the circulating air. Possible sources of loss appeared to be chimney losses and furnace casing losses. The result of flue gas analysis and temperature readings indicated that under ordinary operation, the loss due to dry flue gas was 12.6 per cent; loss due to moisture and hydrogen in the coal 2.5 per cent; loss due to carbon monoxide in flue gas, 4.1 per cent, giving a total at the smoke pipe connection to the furnace as a percentage of the heat in the fuel of 19.2 per cent.

"The remainder of the heat of the fuel consumed, or 21.8 per cent, must be charged to radiation from the front, floor, bonnet and casing of the furnace and to the evaporation of water for humidification."

Table 1

Total Loss in Flue Gas in Per Cent for High Volatile, Bituminous B Coal
(Combustion is assumed as being complete, that is with no carbon monoxide or free hydrogen in flue gas)

Flue Gas Temperature Deg. F.	Per Cent CO_2 in Flue Gas										
	5	6	7	8	9	10	11	12	13	14	15
300	20.6	18.0	16.1	14.7	13.7	12.8	12.1	11.5	11.0	10.6	10.2
400	27.5	23.9	21.3	19.3	17.8	16.5	15.5	14.6	13.9	13.3	12.7
500	34 5	29.8	26.4	23.9	21.8	20.1	18.9	17.8	16.8	16.0	15.3
600	41.8	35.8	31.7	28.6	26.0	23.8	22.3	21.0	19.8	18.8	17.9
700	49.1	42.0	37.0	33.3	30.2	27.6	25.8	24.2	22.8	21.7	20.6
800	56.4	48.1	42.3	37.9	34.4	31.5	29.3	27.4	25.8	24.5	23.3
900	63.9	54.3	47.7	42.7	38.8	35.4	32.9	30.7	28.9	27.4	26.0
1000	71.7	61.0	53.3	47.6	43.1	39.6	36.6	34.2	32.2	30.3	28.8

Note: Maximum percentage of CO_2 for condition of zero excess air is 18.16%.

Table 2

Total Loss in Flue Gas in Per Cent for Anthracite
(Combustion is assumed as being complete)

Flue Gas Temperature Deg. F.	Per Cent CO_2 in Flue Gas										
	5	6	7	8	9	10	11	12	13	14	15
300	19.8	17.0	15.0	13.6	12.3	11.3	10.4	9.8	9.3	8.8	8.4
400	27.3	23.3	20.6	18.5	16.7	15.3	14.1	13.2	12.4	11.7	11.2
500	35.1	29.8	26.1	23.3	21.0	19.2	17.8	16.6	15.6	14.7	14.0
600	42.9	36.4	31.7	28.2	25.4	23.2	21.5	20.0	18.7	17.6	16.7
700	50.8	43.0	37.5	33.3	29.9	27.3	25.2	23.4	21.9	20.7	19.5
800	58.9	49.7	43.3	38.5	34.6	31.5	28.9	26.9	25.1	23.7	22.3
900	66.9	56.5	49.0	43.7	39.4	35.7	32.9	30.5	28.5	26.8	25.3
1000	74.9	63.6	55.4	49.2	44.1	40.0	36.8	34.2	31.9	30.0	28.3

Note: Maximum percentage of CO_2 for condition of zero excess air is 19.35%.

(Oil)

SINCE the entire conservation program was originally aimed at conservation of fuel oil, it is quite likely that the contractor will receive many calls to check the combustion efficiency of an oil-burning plant. The University of Illinois has checked oil- burning installations for efficiency and the report indicates that—

For so-called gun-type oil burners, the minimum CO_2 should be 8 per cent; for vaporizing or rotary burners, the minimum value should be 10 to 12 per cent of CO_2.

An oil-burning system may be checked by a procedure quite similar to that used for coal burning. The burner should be started and when the burner is normally operating, the flame should be observed. If the flame looks white, it is an indication of too much air and the air input should be reduced. If the flame is smoky orange, there is not sufficient air for combustion and the air supply should be increased. Most manufacturers recommend the flame that is just verging on a hazy atmosphere. Take a clean porcelain rod similar to that used in bath rooms and insert the rod in the smoke pipe for about 15 minutes. If, on removal, this rod is sooty, the fire can stand more air.

Insert the tube of the draft gauge into the combustion chamber and out of the path of the flame. The draft should read about 0.02 inches. If the draft reading is taken at the smoke outlet of the furnace, the draft should be between 0.04 and 0.06 inches.

Insert the flue gas thermometer at the smoke outlet of the furnace. If there is a check draft opening in the furnace ahead of the smoke outlet, such opening should be temporarily closed while the reading is taken.

Insert the gas sampling tube from the CO_2 analyzer in the smoke pipe and take a reading. Referring to Table 3, at the intersection of the recorded flue gas temperature reading and the per cent of CO_2 in the flue gas will show the total loss in flue gas in per cent for the oil burner.

The specifications in Commercial Standards CS-75-39 call for a minimum of CO_2 of 8 per cent for oil burners of the gun type and 10 to 12 per cent CO_2 for vaporizing or rotary type burners.

Combustion Efficiency

(Gas)

NOT so often, probably, but on occasion the contractor must check the combustion efficiency of a gas furnace. Ordinarily such checks are made by the gas company at the request of the user.

The procedure used is identical with that used with the oil burner installation and by using Table 4, the intersection of the flue gas temperature and the per cent of CO_2 in the flue gas will give the total loss in flue gas in per cent for natural gas.

Tests conducted by A. G. A. indicate that with natural gas a CO_2 content from 9 to 11 per cent should be aimed for. With mixed gas, a 9 to 12 CO_2 content in the flue gas is possible. With manufactured gas, a 7 to 10 per cent CO_2 content should be attempted.

Table 3

Total Loss in Flue Gas in Per Cent for Oil Fuel
(Combustion is assumed as being complete)

Flue Gas Temperature Deg. F.	Per Cent CO_2 in Flue Gas									
	4	5	6	7	8	9	10	11	12	13
300	22.3	19.2	17.2	15.7	14.7	13.9	13.2	12.7	12.2	11.8
400	29.1	24.8	22.0	19.8	18.3	17.1	16.1	15.4	14.8	14.2
500	36.0	30.4	26.7	24.0	22.0	20.4	19.1	18.1	17.3	16.6
600	42.9	36.2	31.5	28.1	25.7	23.7	22.1	20.9	19.8	19.0
700	50.2	42.1	36.6	32.4	29.5	27.2	25.3	23.8	22.5	21.5
800	57.6	48.0	41.5	36.8	33.2	30.6	28.4	26.6	25.1	23.9
900	65.2	54.1	46.3	41.0	37.2	34.1	31.6	29.5	27.8	26.4
1000	72.5	60.3	51.4	45.3	41.1	37.8	34.9	32.5	30.7	29.1

Example: Given 8% CO_2 and 900° F. temperature.
Total loss in flue gas = 37.2% of fuel fired.
Note: Maximum percentage of CO_2 for condition of zero excess air is 15.25%.

Table 4

Total Loss in Flue Gas in Per Cent for Natural Gas
(Combustion is assumed as being complete)

Flue Gas Temperature Deg. F.	Per Cent CO_2 in Flue Gas							
	4	5	6	7	8	9	10	11
300	22.1	19.9	18.4	17.4	16.6	16.0	15.5	15.1
400	27.4	24.2	22.1	20.6	19.5	18.6	17.9	17.3
500	32.7	28.5	25.8	23 8	22.4	21.2	20.2	19.5
600	38.0	32.9	29.5	27.1	25.3	23.8	22.7	21.8
700	43.4	37.5	33.3	30.5	28.3	26.5	25.2	24.1
800	49.0	42.1	37.1	33.8	31.2	29.2	27.7	26.4
900	54.7	46.7	41.0	37.3	34.3	32.1	30.3	28.7
1000	60.7	51.3	45.0	40.9	37.5	34.9	32.9	31.2

Note: Maximum percentage of CO_2 for condition of zero excess air is 13.01%.

Chimney Draft

HIGH up in the list of common troubles which reduce furnace efficiency is the poor chimney. Poor chimneys are a tough problem because the heating contractor generally can not do very much to improve the chimney construction without radical and expensive chimney alterations by other trades. Since the purpose of a chimney is to produce combustion draft through the furnace, the chimney, first of all, should be checked to see what the draft is. Too little draft prevents necessary combustion; too much draft requires some checking method to reduce over-run in room temperatures caused by combustion continuing beyond the necessary combustion period.

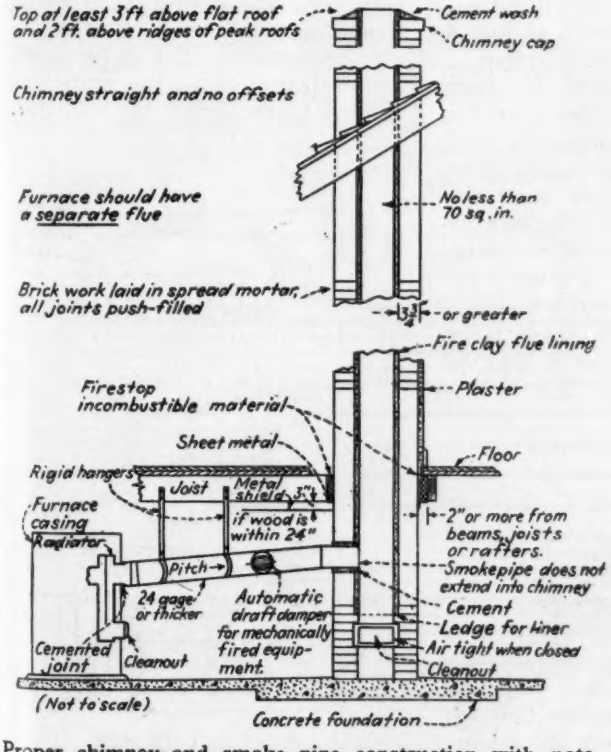
In the case of hand-fired coal furnaces, investigations show that the draft read over the fire should be at least 0.12 inches of water on the draft gauge and preferbly 0.15 inches.

Flue temp at collar Degrees.	Average temp. in chimney Degrees	Draft per foot of flue height in inches of water			
		Outside Temperature			
		At 0 Deg.	At 30 Deg.	At 50 Deg.	At 70 Deg.
300	100	.00216	.00114	.00053	.00009
450	200		.00333	.00272	
500	200	.00435	.00345	.00280	.00255
650	300	.00580	.00494	.00433	.00380
700	300	.00596	.00500	.00450	.00385
800	400	.00680	.00600	.00540	.00500
850	400	.00700	.00618	.00557	.00515
900	400	.00720	.00630	.00570	.00525

This table shows chimney draft per foot of chimney height at selected outdoor temperatures and smoke pipe temperatures.

Sq.Ft.of grate in furnace	Lbs. coal at 5 lbs. per hr.	Inches Draft req'd at 5 lb.rate	Lbs. Coal at 3 lbs. per hr.	Inches Draft req'd at 3 lbs. per hr.	Height of Chimney above Grate			
					26 ft.	30 ft.	40ft.	
					Draft of Chimney in Inches of Water at an assumed temp. of 300 degrees			
					.155	.179	.236	
1.22	6.1	.177	3.6	.151	minimum inside size of chimney			
					8X8	8X8		
1.97	9.8	.182	5.9	.154	8X8	8X8		
2.64	13.2	.192	8.	.158		8X8	9X12	
3.17	15.8	.195	9.5	.162		8X8	9X12	

Minimum chimney liner sizes required for 26, 30 and 40-foot chimneys to burn coal at 5 and 3 pound combustion rates at the minimum smoke pipe temperature of 300 deg. (Both tables prepared by L. W. Millis of Security Stove & Mfg. Co., Kansas City.)



Proper chimney and smoke pipe construction with notations pointing to critical features.

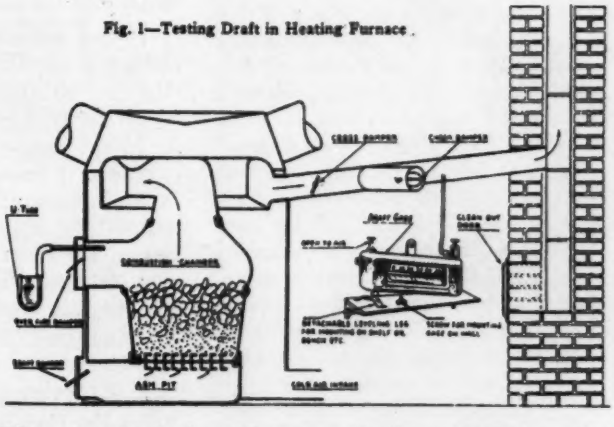
If anthracite is burned instead of bituminous coal, particularly in small sizes, greater draft will be required.

In the case of stoker-fired furnaces, with bituminous coal, the draft should be at least 0.05 inches of water.

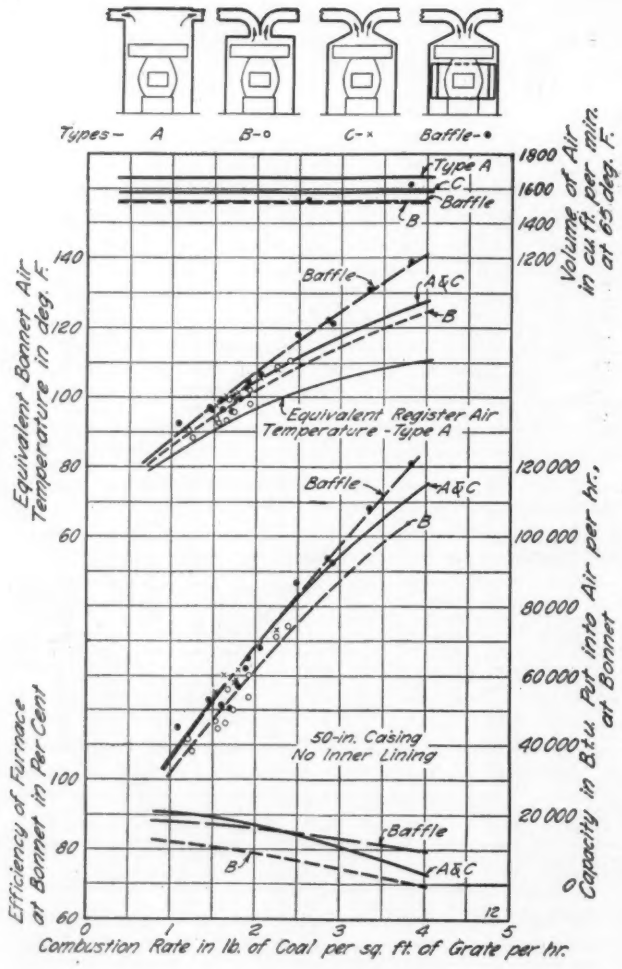
In the case of gas burners and gun-type oil burners, the draft may be as low as 0.05 inches, but for vaporizing type oil burners, the draft should be 0.06 to 0.08 inches of water.

(*Continued on page* 88)

Fig. 1—Testing Draft in Heating Furnace.



Where to take draft readings over the fire and in the smoke pipe in a hand-fired coal furnace. Note smoke pipe reading is made between chimney and draft regulator.



Check TO SAVE FUEL!

Bonnet Temperatures

QUITE frequently the contractor shooting trouble on a heating system will encounter the complaint that certain rooms are difficult to heat. The first thing usually done is to adjust dampers in the various leader pipes to throw more warm air to the underheated room. Oftentimes this does not solve the problem, so this item suggests that the contractor take a thermometer and read temperatures around the bonnet to see if the room which is underheated is being supplied by colder air than is flowing to other leader pipes.

This is a frequent characteristic of poor bonnet construction. The accompanying diagrams show the University of Illinois Engineering Experiment Station recommendation on several types of bonnets for both gravity and forced air plants.

If the bonnet check shows large temperature differences it may be that a better type of bonnet will cure the trouble.

In the case of a bonnet which is too low, it may be possible to build a high plenum either of metal or substitute material to compel the warm air from the furnace to mix completely in the plenum before air passes into the leader pipes.

Diagrams left and right from the University of Illinois Engineering Experiment Station Bulletins show the results in temperature, efficiency, capacity, and air volume for different types of bonnets.

If nothing can be done with the bonnet, a liner as shown in the diagram above, may equalize temperatures. Baffles also act as radiation shields and tend to raise casing air temperatures. The baffle shown begins 1 inch above the grate and stops 5 inches below the radiator.

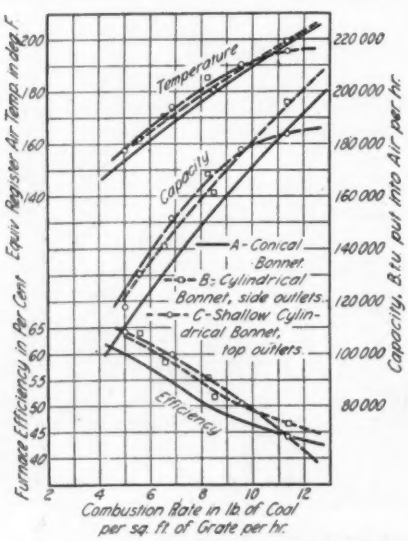

Temperature
Capacity
A - Conical Bonnet.
B - Cylindrical Bonnet, side outlets.
C - Shallow Cylindrical Bonnet, top outlets.
Efficiency
Equiv. Register Air Temp. in deg. F.
Furnace Efficiency in Per Cent
Capacity, B.t.u. put into Air per Hr.
Combustion Rate in lb. of Coal per sq. ft. of Grate per hr.

FIG. 27. PERFORMANCE CURVES WITH THREE TYPES OF BONNETS

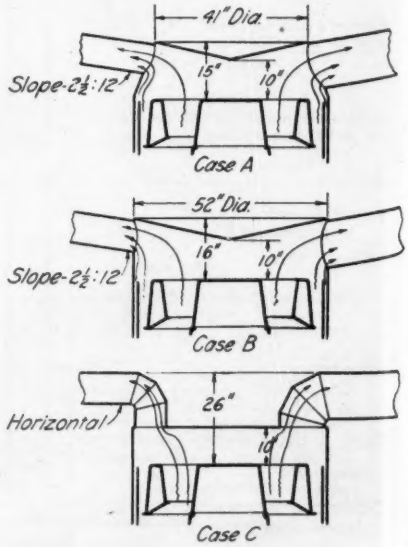


FIG. 26. THREE TYPES OF BONNETS TESTED

House Insulation

SINCE most types of insulation are not restricted and since a good insulation job can be purchased on an extended payment plan, and since insulation both decreases fuel consumption and increases comfort in summer and winter, the advantages of insulation to the owner are obvious.

Much has been published regarding the savings of insulation, but for the purpose of explaining the value of insulation to a home owner or for the purpose of estimating the approximate fuel saving which may be expected when insulation is applied to a given system, the two figures accompanying probably give as fair and complete a picture as any illustrations published.

Fig. 65, from the University of Illinois Engineering Experiment Station Circular 26 shows the calculated heat losses for a typical residence when a certain type of heat conservation measure, such as insulation, weatherstripping, storm sash, are added to the building. In this case the tests were run on the Research Residence. Later tests made in the Research Residence indicate that a factor of safety should be applied to the calculated reduction in heat loss, in order to obtain a reasonable estimate of reduction in fuel consumption.

The National Mineral Wool Association recommends that calculated reductions in heat loss be reduced 20 per cent for safety. For example, Item M in Fig. 1 gives a calculated reduction of 66.1 per cent with full thickness insulation applied to the side walls and ceiling, and with storm sash applied to all windows. Reducing this value by 20 per cent gives an estimated fuel reduction of 0.8 x 66.1 or 52.9 per cent. This is in reasonably good agreement with the actual heat loss test made in the Research Residence.

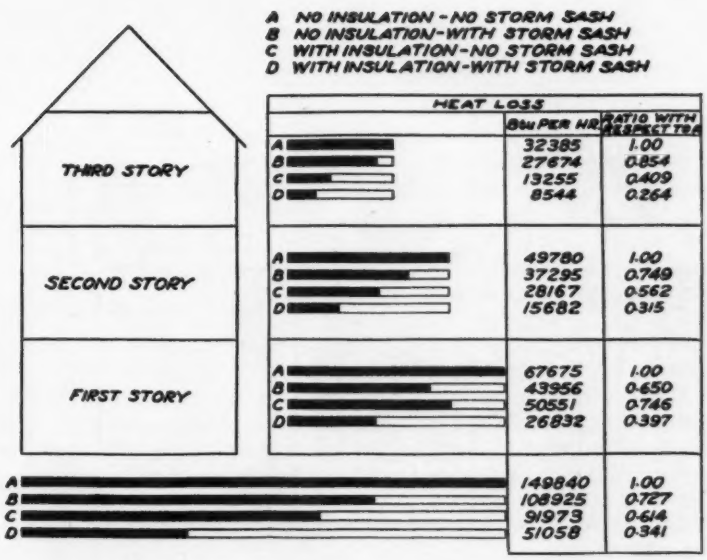


Fig. 3—Calculated heat losses from Research Residence for 80 F difference

Fig. 65 indicates that certain heat conservation measures give the owner a better return on his investment than do other measures. For example, Case H shows that when 3 inches of insulation are placed in the top floor ceiling, but no insulation in the wall and no weather stripping and no storm sash, a total saving of 14.1 per cent is made in fuel consumption.

When 3½ inches of insulation is put in all walls of the structure, plus the 3½ inches of insulation in the ceiling, the total reduction approximates 35 per cent, but the cost becomes much greater. (Case J.)

It is interesting to note in Fig. 65, that the single greatest fuel conservation measure which the home owner can make is to install tightly fitting storm sash and doors on all windows and doors. This is indicated by Case L, which shows a total saving of 31.3 per cent for storm sash and doors. Complete storm sash and doors may not be as cheap a measure as insulation in the top floor ceiling, but this will have to be determined by actual estimate of the heat loss.

Fig. 3 shows the interesting result of applying heat conservation measures to multi-story buildings; in this case the 3-story Research Residence. Fig. 3 shows the calculated heat losses from the Research Residence for an 80-deg. temperature difference when in-

(*Continued on page 74*)

Case	Insulation Wall	Insulation Ceiling	Weather Strip	Storm Sash	Calculated Hourly Heat Loss in Per Cent of Maximum Rate (0 20 40 60 80 100)	Reduction, %
a	None	None	None	None		0
b	1-in.	None	None	None		12.8
c	2-in.	None	None	None		17.4
d	3-in.	None	None	None		19.7
e	3⅝-in.	None	None	None		20.3
f	None	1-in.	None	None		11.3
g	None	2-in.	None	None		13.3
h	None	3-in.	None	None		14.1
i	None	3⅝-in.	None	None		14.5
j	3⅝-in.	3⅝-in.	None	None		34.8
k	None	None	Yes	None		9.8
l	None	None	None	Yes		31.3
m	3⅝-in.	3⅝-in.	None	Yes		66.1

FIG. 65. CALCULATED HEAT LOSSES FOR TYPICAL RESIDENCE
(U. of I. Eng. Exp. Sta. Circular 26, p. 109)

Table I

Pressure Losses, Inches of Water

Air Velocity Ft. per min. →	200	400	600	800	1000	Notes ↓
A. - Inlet Grille						
	0.002	0.010	0.022	0.040	0.063	Based on loss of 1.0 velocity pressure
B. - Return Duct - (Frictional loss for 100 ft. of duct)						Based on friction chart
Equivalent Duct diameter in in.						
6	0.02	0.08	0.16	0.27	0.41	
7	0.02	0.07	0.13	0.22	0.33	
8	0.02	0.06	0.11	0.19	0.28	
9	0.02	0.05	0.09	0.16	0.24	
10	0.01	0.04	0.08	0.14	0.22	
11	0.01	0.04	0.07	0.13	0.19	
12	0.01	0.03	0.07	0.12	0.17	
13	0.01	0.03	0.06	0.10	0.15	
14	0.01	0.03	0.05	0.09	0.14	
16	0.01	0.02	0.04	0.08	0.12	
18	0.01	0.02	0.04	0.07	0.10	
E. - Warm Air Ducts						
See Item B on return ducts. Values tabulated in Item B for return ducts are also applicable to warm air ducts.						
F. - Warm Air Registers						
Free Area	Plain grilles, no deflection of air					Based on
50%	0.01	0.03	0.06	0.11	0.17	2.75 v.p.
60%	0.00	0.02	0.04	0.06	0.11	1.6 v.p.
70%	0.00	0.01	0.02	0.04	0.07	0.9 v.p.
80%	0.00	0.00	0.01	0.02	0.03	0.5 v.p.
Deflectors - For deflected flow at 45° angle, use twice the value shown.						
G. - Velocity Head of air leaving register						
	0.00	0.010	0.022	0.040	0.063	1.0 v.p.

This table substitutes for the standard Friction Chart by showing (in 100 foot ducts) the resistance at grilles, in returns, in supplies for customary system velocities.

Table II

Pressure Losses, Inches of Water

Item C. Air Filters	c.f.m. per filter (for filters in parallel arrangement)							
Air Quantity in cu. ft. per minute	100	200	300	400	500	600	700	800
Air filters with viscous coated fibers, 2 in. thick, 16 x 25 in. filters. 2.78 sq. ft.								
New filters	0.01	0.01	0.02	0.03	0.06	0.07	0.09	0.12
For Service Condition	0.01	0.02	0.04	0.06	0.12	0.14	0.18	0.24

Item D. Furnace Casing	Total c.f.m. through casing					
Air Quantity in cu. ft. per minute	400	800	1200	1600	2000	2400
Unbaffled casing	0.01	0.02	0.02	0.03	0.03	0.04
Baffled casing	0.01	0.02	0.03	0.04	0.05	0.06

Item I. Air Washer - Eliminator Plates, one row.	Total c.f.m. through washer					
Air Quantity in cu. ft. per minute	400	800	1200	1600	2000	2400
Eliminator Plates	0.01	0.02	0.03	0.04	0.05	0.06

Resistance in casings, filters, and washers is frequently higher than calculated. Especially in old furnaces the resistance in the casing should be checked. Some of the new, small furnaces also show high resistance.

CUSTOMARY practice designs a forced warm air system with air delivered by the fan against a calculated overall system resistance. Where this overall system resistance exceeds the calculated resistance, there is the possibility that the fan will not deliver the required amount of air and the owner will waste fuel by over firing the furnace in order to be comfortable.

Resistance in Duct Systems

In another item in this section, a method of determining the actual air delivery of a system is described.

Casings May Show High Resistance

In many older forced warm air systems the installation was made and the fan was selected for operation against a total resistance in the system of approximately ¼-inch water gauge. Later investigations at the Research Residence have indicated that this one-quarter-inch resistance is often times too low and that where certain types of registers are used and where careless fittings are installed in the duct system and where the resistance through the furnace casing exceeds the resistance calculated, the overall resistance of the system against which the fan must operate can readily reach one-half-inch or even three-quarter-inches water gauge. In such cases, the installation will not operate and fuel will be wasted.

Under the present circumstances, it may not be possible for the contractor to rip out and install a new low-resistance duct system, so a check should be made to see if there is one or two places where a great deal of the resistance can be eliminated by substituting a very few pounds of galvanized or black iron.

Registers Show High Resistance

In this connection, we suggest that contractors obtain from the University of Illinois Engineering Experiment Station a Bulletin No. 342, entitled "Pressure Losses in Registers and Stack Heads in Forced Warm Air Heating." In the conclusions drawn in this bulletin, the following is stated:

"The pressure loss through a register may be comparable with the total amount of pressure available for forcing the air through a warm air duct system, and the necessity for taking into consideration the pressure losses of the individual registers used can not be too strongly emphasized. In general, the pressure losses for perforated grille-type registers are greater than those for bar-type registers. Setting the

Table III

Pressure Loss Through Cooling Coils

Description of Coils — Finned tube type, tube diameter 5/8 in., fins 1-7/16 in. overall diameter, 8 fins per inch.

Air Velocity feet per minute →	100	200	300	400	500	600	700	
1 row deep	0.01	0.02	0.03	0.05	0.08	0.11	0.15	
2 rows "	0.02	0.03	0.06	0.10	0.15	0.21	0.27	
3 " "	0.02	0.04	0.08	0.14	0.21	0.30	0.39	
4 " "	0.03	0.05	0.10	0.18	0.27	0.38	0.51	
5 " "	0.03	0.06	0.12	0.22	0.33	0.47	----	
6 " "	0.04	0.07	0.14	0.26	0.39	0.55	----	
7 " "	0.04	0.08	0.17	0.30	0.45	----	----	

Above values are for dry air friction. If coils become wet increase above values at least 25 per cent.

Cooling coils may not be a frequent cause of trouble, but this table is inserted so that these three tables constitute a complete reference for checking resistance in systems.

deflecting vanes in a register to deflect the air stream more than about 30 degrees results in excessive pressure losses. No material reduction in pressure losses can be effected by rounding the throat of a stack head. A material reduction in pressure losses can be effected by proper use of turning vanes in the stack heads."

In the book "Winter Air Conditioning" by S. Konzo, Chapter 24 deals with pressure losses through the duct systems and presents two tables which are reproduced with this item. Table 1 shows the approximate pressure losses of grilles, registers, and ducts and Table 2, the approximate pressure losses of filters, casing and washers.

Tables of Resistance

If the contractor knows the velocity in the system or parts of a system and can reduce square pipe to equivalent round pipe diameters, the tables will provide a guide to the pressure losses which should be expected in a good system. If the pressure losses read at the register or in the pipes exceed the losses indicated in Tables 1 and 2, then the contractor can be pretty certain that there are bad fittings or poor design in the system and that this improper duct system is setting up resistance which is reducing the volume of air passing through the system.

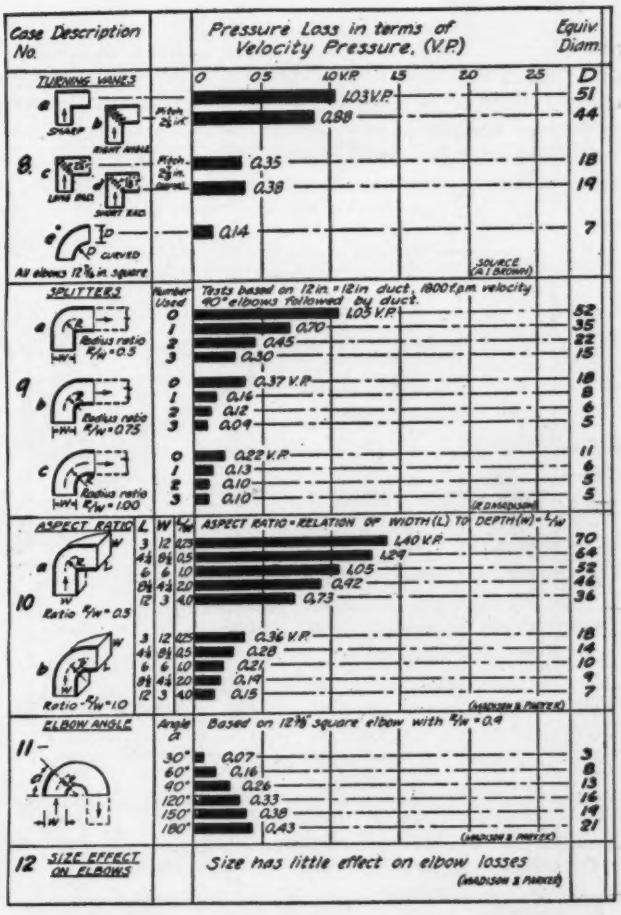
Space does not permit in this short review of friction losses in ducts systems, a presentation of the data showing probable pressure losses in various types of fittings which have been published in "Winter Air Conditioning" and also two or three times in AMERICAN ARTISAN. Readers should have these diagrams showing pressure losses in terms of equivalent lengths and any reader interested who does not have copies may either get tear sheets from AMERICAN ARTISAN or we will advise where these charts can be obtained.

What to Do with Poor Fittings

The question arises under present material restrictions, of course, what can the contractor do if he determines that certain parts of a duct system are creating excessive friction. The first attempt to be made should be changing the pulleys on the fan or motor to increase the fan speed. If this still does not produce the required air volume, then the contractor can search out the various parts of the system suspected of setting up excessive resistance and then determine if these offending parts can be remedied.

For instance, if the directional flow registers are establishing high resistance, contractors can decrease the angle of the vanes and see if air volume is increased. It is not likely that the registers can be removed and different types substituted, but there will be cases when even this can be done. If there is excessive friction loss in the registers or stack head, turning vanes which would require a very small amount of stock material can be tried. If there are too many sharp elbows and if the elbows are poorly designed, again, a small amount of material used as turning vanes may remedy the situation. If the whole duct system shows excessive resistance, then probably little can be done at present, unless duct systems of substitute material are used in place of the present metal.

Experience indicates, however, that generally speaking it is the fittings in a system which create excessive resistance, particularly elbows, and the charts referred to above indicate that even the worst type of square throat and square back elbows can be reduced two or three hundred per cent by the use of suitable turning vanes.


Case Description No.
Pressure Loss in terms of Velocity Pressure. (V.P.)
Equiv. Diam.
TURNING VANES
SQUARE
RIGHT ANGLE
LONG RAD.
SHORT RAD.
CURVED
All elbows 12"x12" in. square
SOURCE (A.I. BROWN)
SPLITTERS
Number Used
Tests based on 12 in. x 12 in. duct, 1900 f.p.m. velocity 90° elbows followed by duct.
Radius ratio R/W = 0.5
Radius ratio R/W = 0.75
Radius ratio R/W = 1.00
(R.D. MADISON)
ASPECT RATIO
ASPECT RATIO = RELATION OF WIDTH (L) TO DEPTH (W) = L/W
Ratio = W/W = 0.5
Ratio = W/W = 1.0
(MADISON & PARKER)
ELBOW ANGLE
Angle α
Based on 12"x6" square elbow with R/W = 0.4
12 SIZE EFFECT ON ELBOWS
Size has little effect on elbow losses
(MADISON & PARKER)

This chart is one of a series of six published in "Winter Air Conditioning." Contractors should have either the book or the tables in order to study the resistance probably encountered in fittings of all types. Note especially how resistance of poor fittings can be decreased by use of turning vanes.

OVER a period of several years a number of control methods have been investigated in the Research Residence. Some of the ideas (for instance storing heat in the bonnet) have been found unsatisfactory. When one of these methods was tested the industry, probably, was installing the method and there still may be installations using the method without the owner knowing the method can be improved.

The contractor attempting fuel conservation should, therefore, check the control method carefully and if it is found that a discontinued method is still used, the hookup should be changed. Usually, no new instruments will be needed.

These investigations on control systems are discussed in detail and summarized in "Winter Air Conditioning," Chapter 17. Every contractor should study these tests carefully. Two tables summarizing the methods are reproduced here.

Controls on Forced Air Systems

CONTROL SYSTEMS on forced air system heating plants are of many varieties. A number of different types of single, individual and combination instruments are employed in the circuit. But, as a general rule, the ordinary forced warm air control system consists of a room thermostat, which actuates a relay; the relay stops and starts the fuel burning device; an instrument in the bonnet of the furnace starts and stops the fan; and a circuit combustion control is inserted to stop combustion before the thermostat is satisfied to prevent room temperature overrun.

The instruments which operate this cycle may be individual units or combination instruments. In most cases, the instruments themselves are difficult to adjust in the field, if the contractor knows that something seriously is wrong. Again, it is suggested that the instruments be removed and taken to the manufacturer for checking and adjustment.

If the forced warm air system is reasonably old or if the home owner has been given to "fiddling" with the control system, it is quite possible that the contractor can make certain fundamental adjustments which will result in more efficient operation, and hence a reduction in fuel consumption.

For example, in many old systems the fan starts at approximately 175 deg. and stops at 150 deg. This results in short cycles of hot air introduced into the room. The industry now believes that longer operating cycles at lower register air temperature, thus producing more continuous forced cir-

TABLE 3

SUMMARY OF OPERATING CHARACTERISTICS OF CONTROLS TESTED

Control Systems	Simplicity in Arrangement	Uniformity in House Air Temperatures	Equalization of Room Temperature for All Weather Conditions	Uniformity in Combustion Control	Low Heat Loss From Ducts	Uniformity of Bonnet Air Temperatures	Power Consumption of Fan Motor	Handling of Sudden Load Demands	Sudden Demands Cause Overruns, Without Stack Limit	Stack Limit Thermostat Adaptable	Fan Cut-in Arrangement Adaptable	Hold-fire Arrangement Adaptable	Notes
Column	1	2	3*	4	5	6	7†	8‡	9	10‡	11‡	12‡	13
B	Very Simple	Fair	Good	Fair	Very Good	Fair	High	Fair	In Flue	x			Many good features
A	Simple	Poor	Poor	Poor	Good	Good	Intermittent Fan Operation Costs Approximately the Same	Fair	In Flue	x			Simple but operation not satisfactory
C	Simple	Good	Good	Good	Very Poor	Poor		Poor	In Bonnet				Excessive number of fan starts; temperature over-run in bonnet
E	Complex	Fair	Fair	Fair	Good	Fair		Good	None				Frequent bonnet thermostat adjustment necessary
D	Very Complex	Good	Fair	Fair	Good	Fair		Fair	In Bonnet	x	x	x	Adjustment complex, can be simplified
G	Very Complex	Good	Fair	Very Good	Good	Good		Fair	In Flue	x	x	x	Adjustment complex, otherwise good
J	Complex	Good	Fair	Very Good	Good	Very Good		Good with Stack Thermostat	In Bonnet	x	x		Bonnet thermostat adjustment necessary
F	Complex	Very Good	Good	Very Good	Good	Very Good			In Bonnet	x	x	x	Very good control of all factors
H	Complex	Very Good	Good	Very Good	Good	Very Good			In Bonnet	x	x	x	Very good control of all factors

*Col. 3—Based on breathing level temperatures in the different rooms.
†Col. 7—See section 48 for discussion of power consumption of fan motor.
‡Col. 8—See sections 45, 46, and 47 for discussion of auxiliary arrangements.

culation throughout the rooms, is beneficial. Accordingly, the contractor should inspect the fan start and stop setting and should stop the fan at approximately 110 degrees for baseboard registers, or 100 degrees for high sidewall registers, and start the fan at approximately 25 degrees higher. This 25 degree differential should enable the furnace to keep up with fan operation after the fire gets going.

Fuel Saving

The high limit instrument which stops combustion before the thermostat is satisfied, has frequently been used merely as a safety device and accordingly was set at 300 or more degrees. At such a setting this instrument does little good and seldom operates. The contractor can make this fire limit control a fuel saver by setting the temperature at which this high limit instrument takes control of the system as near to register temperature or as near to fan-on setting as possible.

For instance, if the fan starts to operate at 135 degrees, it should be possible (unless the duct heat loss is excessive) to set the high limit control at 150 degrees. When the high limit control is set somewhere near the fan-start setting, the high limit control will cut in at frequent intervals and conserve fuel by stopping combustion before room temperatures are overrun.

TABLE 2
CHARACTERISTICS OF CONTROLS STUDIED

Control System	Fan Operation	Characteristics
B	Continuous	1. *Damper operation controlled by room thermostat only. 2. Continuous fan operation.
A	Intermittent	1. Damper operation controlled by room thermostat only. 2. Fan operation controlled by bonnet thermostat only.
C	Intermittent	1. Damper operation controlled by room thermostat only. 2. Fan operation same as control A except that fan was rendered inoperative when furnace damper was closed.
E	Intermittent	1. Damper operation controlled by bonnet thermostat. 2. Duration of damper opening determined by time required for bonnet air temperature to rise through a predetermined temperature differential. 3. Fan operation controlled by room thermostat through relay. 4. Fan rendered inoperative during furnace pick-up periods.
D	Intermittent	1. Four-point thermostat. 2. Damper operation controlled by both room thermostat and bonnet thermostat. 3. Damper operated when room temperature fell below normal operating range. 4. Fan operation controlled by room thermostat through relay. 5. Second low limit on bonnet thermostat to prevent blowing cold air through registers.
G	Intermittent	1, 2. Same as in control D. 3. Duration of damper opening a fixed percentage of "fan on" period, when damper operation is necessary. Opening of damper on any particular cycle determined by bonnet air temperature. 4, 5. Same as in control D.
F	Intermittent	1. Two-point thermostat. 2. Damper operation controlled by bonnet thermostat; except that damper would not open if room thermostat was satisfied, even though bonnet air temperature was in "damper open" region. 3. Duration of damper opening a variable percentage of "fan on" period and dependent on bonnet air temperature. 4. Fan operation controlled by room thermostat through relay. 5. Second low limit on bonnet thermostat to prevent blowing cold air through registers. 6. Stack limit thermostat auxiliary equipment to close furnace damper to prevent over-runs in temperature.
J	Intermittent	1. Two-point thermostat. 2. Damper operation controlled by bonnet thermostat; damper opened to maintain bonnet air temperature up to a predetermined value, irrespective of room air temperature conditions. 3. Duration of damper opening dependent on bonnet air temperature and independent of room air temperatures. 4. Fan operation controlled by room thermostat through relay.
H	Intermittent	Same as control F except that closing of damper occurred whenever room thermostat was satisfied even though bonnet air temperature was not up to upper range.

*The term "damper" always refers to the damper in the door of the ash-pit.

High Limit Switch in Gravity Control

EITHER the gravity furnace will be operated by a manual chain or there will be a thermostat and a damper motor. In the case of the chain operated system, there is little or nothing the contractor can do.

But, in the case of the thermostat and damper motor system, the contractor can check the wiring to see that the thermostat actually operates and he can inspect the thermostat contact points to see that they are bright, clean and smooth.

If anything more than cleaning is required, it is suggested that the thermostat be taken to the manufacturer because most thermostats are difficult to adjust.

Screw drivers and files of one sort or another are not suitable tools for cleaning thermostat contact points. If the points are badly pitted, then probably new points should be added by the manufacturer. If a small amount of smoothing is called for, then a very fine, very thin file should be used to carefully smooth the surfaces, keeping the surfaces parallel to one another. A calling card or thin rough cardboard frequently will serve to smooth the points.

There are a number of types of damper motors and most damper motors are not easy to adjust if there is anything seriously wrong with the motor. The better procedure is to remove the motor and have the manufacturer check it over and put it in condition.

Many original gravity systems had only the damper motor and the thermostat. Later installations included a high limit switch in the thermostat—damper motor circuit, set to close the draft door whenever the temperature in the bonnet exceeded a pre-selected temperature. The purpose of this second control was to prevent room temperature overrun and to close the draft before the thermostat was satisfied so that where a heavy fire is going, the furnace will start to

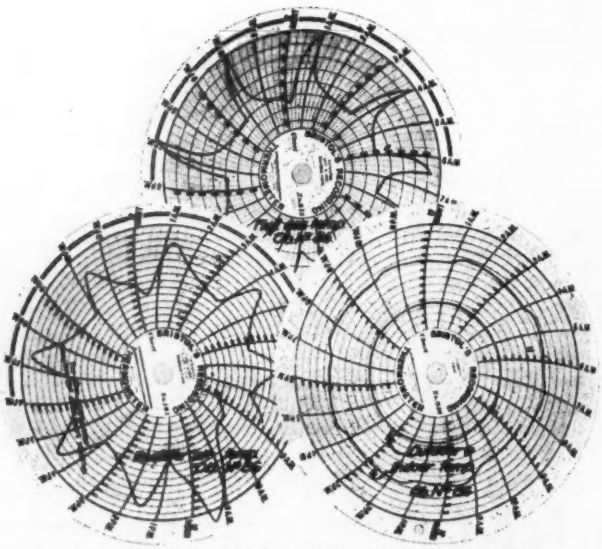


FIG. 262. ROOM, REGISTER AIR, AND FLUE-GAS TEMPERATURE RECORDS FOR SINGLE CONTROL
In reading the Register Air Temperature chart deduct 50 deg. F. from the chart figures.

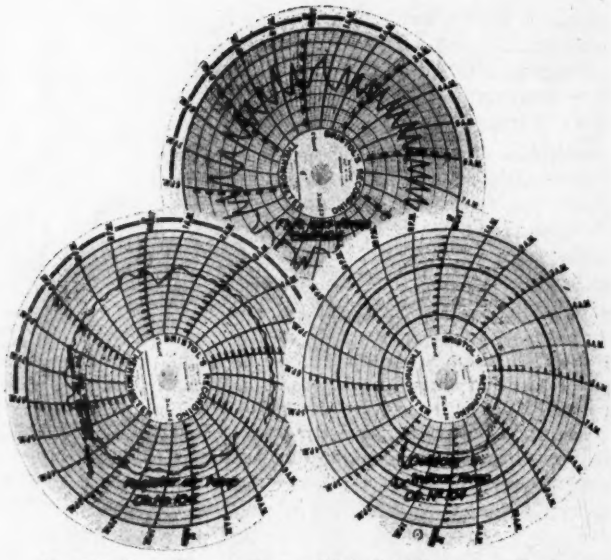


FIG. 263. ROOM, REGISTER AIR, AND FLUE-GAS TEMPERATURE RECORDS FOR DUAL CONTROL
In reading the Register Air Temperature chart deduct 50 deg. F. from the chart figures.

close down and the temperature and combustion be stopped before the thermostat is satisfied. Research Residence tests show a fuel saving of at least 4 per cent with a limit control.

It may be that limit controls can be obtained and that WPB may release materials for limit controls; the fuel saving makes any attempt to get these instruments worth while.

Where a high limit control is installed already, the contractor should check the temperature setting and lower the setting to some point near 200 degrees. If the check is made in the summer with the furnace cold, little can be done to check the setting other than to change the setting to 200 deg. and perhaps call back or explain to the owner how the instrument can be changed after the heating season starts. The purpose of this suggestion is to remind dealers that in many old systems, the high limit switch was installed merely as a safety device and was set at 300 or 350 or even 400 degrees. At such a setting, this instrument never operated and therefore can't save any fuel. As we now operate such a system, this high limit switch cuts in as near above register temperature as possible so that we have a minimum override of room temperature. This is a fuel conservation measure.

The Fan Delivery

IN any forced warm air heating system where there is complaint by the owner of underheating, or unsatisfactory heating; or where there is evidence of excessive firing (scorched casing or warped doors) the contractor should test the fan to see that it is delivering the air required to heat the house.

If the fan is not delivering the required amount of air, then the home owner probably is burning excessive amounts of fuel in order to keep comfortable.

Lacking any data sheet to indicate the house heat loss or the calculated cfm, the contractor can make a rough estimate of the air volume required by figuring the total cubage of the rooms heated and assuming that five air changes per hour were calculated. Multiply the cubage by five and divide by 60, or divide the cubage by 12 to arrive at an approximate cubic feet of air per *minute* required for five air changes. For example, if there are 10,000 cu. ft. of house to be heated, dividing 10,000 by 12 gives 833 cfm.

If the contractor is familiar with the particular make and model of fan installed, he probably can refer to manufacturers' tables which show the delivery of this fan, against given resistances. What the resistance encountered in the actual system will do to air delivery is discussed in another item in this section (Resistance in Duct Systems).

Lacking any information on the delivery of the model and make of fan, the contractor can approximately determine fan delivery by the following procedure.

Assuming the contractor has a velocity meter, cut a hole in the warm air supply main large enough to insert the tube and jet of the meter and take several readings throughout the area of each duct. Calculate an average velocity in each main supply duct and multiply the velocity by the area in square feet to determine the cu. ft. of air per minute passing through the main or mains. Some sort of packing should be used around the tube in the hole to prevent the loss of air through the hole in which the tube and jet is inserted. If the

Pressure Losses in Ducts Inches of Water

Air Velocity Ft. per Min.	200	400	600	800	1000
Equivalent duct diam. in inches	Frictional loss for 100 ft. of duct				
6	0.02	0.08	0.16	0.27	0.41
7	0.02	0.07	0.13	0.22	0.33
8	0.02	0.06	0.11	0.19	0.28
9	0.02	0.05	0.09	0.16	0.24
10	0.01	0.04	0.08	0.14	0.22
11	0.01	0.04	0.07	0.13	0.19
12	0.01	0.03	0.07	0.12	0.17
13	0.01	0.03	0.06	0.10	0.15
14	0.01	0.03	0.05	0.09	0.14
16	0.01	0.02	0.04	0.08	0.12
18	0.01	0.02	0.04	0.07	0.10

TABLE NO. 4
EQUIVALENT ROUND AND RECTANGULAR DUCTS FOR EQUAL FRICTION

Side of Rect. Duct	Diameter of Equivalent Round Pipe																		
	2½	3	3½	4	4½	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
8	4.7	5.2	5.7	6.1	6.5	6.9	7.6	8.2	8.8											
8½	4.9	5.4	5.9	6.3	6.7	7.1	7.8	8.5	9.1	9.6										
9	5.0	5.5	6.0	6.5	6.9	7.3	8.0	8.7	9.3	9.9										
9½	5.1	5.7	6.2	6.6	7.1	7.5	8.2	8.9	9.6	10.2	10.7									
10	5.2	5.8	6.3	6.8	7.2	7.7	8.4	9.2	9.8	10.4	11.0									
10½	5.4	5.9	6.5	7.0	7.4	7.8	8.6	9.4	10.0	10.7	11.3	11.8								
11	5.5	6.0	6.6	7.1	7.6	8.0	8.8	9.6	10.2	10.9	11.6	12.1	12.6							
11½	5.6	6.2	6.7	7.2	7.7	8.2	9.0	9.8	10.6	11.2	11.8	12.4	12.9	13.4						
12	5.7	6.3	6.9	7.4	7.9	8.3	9.2	10.0	10.7	11.4	12.0	12.6	13.2	13.7						
12½	5.8	6.4	7.0	7.5	8.0	8.5	9.4	10.2	10.9	11.6	12.2	12.9	13.5	14.0						
13	5.9	6.5	7.1	7.7	8.2	8.7	9.5	10.4	11.1	11.8	12.5	13.1	13.7	14.3						
13½	6.0	6.6	7.3	7.8	8.3	8.8	9.7	10.6	11.3	12.1	12.7	13.4	14.0	14.6	16.1					
14	6.1	6.7	7.4	7.9	8.5	8.9	9.9	10.8	11.6	12.3	12.9	13.6	14.3	14.9	16.4					
14½	6.2	6.8	7.5	8.1	8.6	9.1	10.1	11.0	11.7	12.5	13.2	13.9	14.6	15.1	16.7	16.2				
15	6.3	6.9	7.6	8.2	8.7	9.2	10.2	11.1	11.9	12.7	13.4	14.1	14.7	15.3	16.9	16.6	16.3			
15½	6.4	7.0	7.7	8.3	8.9	9.4	10.4	11.3	12.1	12.9	13.6	14.3	14.9	15.6	16.2	16.8	17.3			
16		7.1	7.8	8.4	9.0	9.5	10.5	11.4	12.3	13.1	13.8	14.5	15.2	15.8	16.5	17.1	17.6			
17		7.3	8.1	8.6	9.2	9.8	10.8	11.8	12.6	13.5	14.2	15.0	15.7	16.3	17.0	17.6	18.2	18.7		
18			8.2	8.8	9.5	10.0	11.1	12.1	13.0	13.8	14.6	15.4	16.1	16.8	17.4	18.1	18.7	19.2	19.8	
19				9.1	9.7	10.3	11.4	12.4	13.3	14.2	15.0	15.8	16.6	17.2	17.9	18.6	19.2	19.8	20.4	20.9

Left—Standard Friction Chart converted to a table showing friction loss at various velocities in ducts 100 feet long. Right—Table for converting rectangular pipe to round pipe of equivalent resistance.

cfm shown by this calculated reading is less than the cfm required for the system, then the fan can be speeded up or the system can be checked to determine where resistance is cutting down air delivery.

Assuming the contractor has no velocity meter, but does have a draft gauge, pressure readings can be taken in the mains as described above and, using the tables which are furnished by the manufacturer with the draft gauge these pressure readings can be converted into velocities and the velocities into cfm as described.

Or, by using the tables accompanying, square pipe can be converted to equivalent resistance round pipe and straight runs plus fittings converted to equivalent lengths and the resistance read from the tables. Note resistance is in terms of 100 feet of pipe and must be converted to actual equivalent length.

If it is impracticable to take readings in the basement, then air velocity readings can be taken at all registers, with the dampers and the register valves in the operating position. This will require more readings than when the readings are taken in basement mains, but will eliminate the need for cutting into the pipes.

If the fan can not be speeded up without overloading the motor, then the contractor should recommend to the owner that certain changes probably are required in the duct system and the resistances set up by the duct system should be checked against the resistances shown in Tables in another item in this section.

Overfiring because of inadequate air delivery is a quite common fuel waste situation.

Duct Insulation

THE VALUE and economy of insulating the ducts of a warm air heating system, whether gravity or forced sir, are summarized in "Winter Air Conditioning" as follows—

"In order to reduce the loss of heat from ducts carrying warm air and hence to provide more uniform values of air temperatures at all the registers, the use of duct insulation is recommended in the following cases:

"(a) A duct which extends into or through an unheated space or unexcavated area should be insulated.

"(b) A riser in a studding space that is exposed to the outdoors or an unheated space should be protected.

"(c) Objectionable drafts may be encountered in rooms where the register air temperature is lower than 110 degrees. Therefore, in a system with one or more ducts greater in length than the majority, and where the resulting register air temperature may be lower than 110 degrees, such ducts should be insulated against heat loss.

"(d) Ducts to first story rooms should be given special attention in this respect (c), particularly if the fan is operated intermittently. During off-periods of the fan no appreciable gravity flow will take place in such first story leaders and the ducts will tend to cool off. When the fan next starts, cool air from these ducts will be discharged into the room. Insulation minimizes this trouble.

"(e) Undersized ducts can be increased in total capacity by insulation which raises the air temperature at the same air volume.

"(f) Return air ducts from second stories in cold outside walls can cool below the calculated 65 degree return air temperature. This increases the heat load on the furnace slightly."

Check to Save Fuel!

Filter Condition

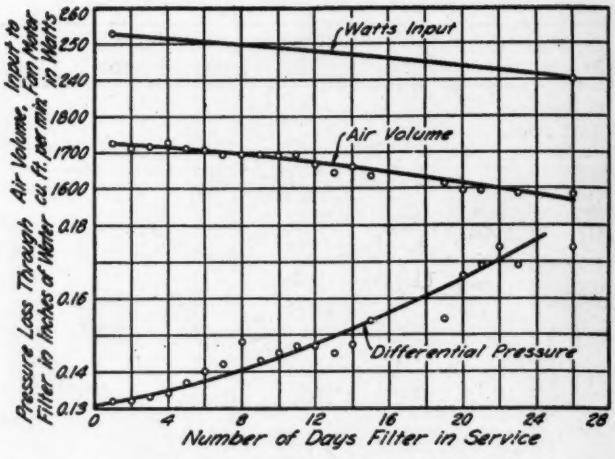

Watts Input
Air Volume
Differential Pressure
Pressure Loss Through Filter in Inches of Water
Air Volume, cu. ft. per min.
Input to Fan Motor in Watts
Number of Days Filter in Service

Fig. 2—Rate of increase in air resistance of Filter No. 1 with service up to 26 days. Note increased resistance, decreased air volume passing.

FILTERS for cleaning the air ordinarily are a part of the original forced warm air system. Many home owners have removed filters and permit the air to circulate without cleaning. In too many cases, a schedule for checking the condition of the filters and installing new filters would be definitely beneficial to the home owner because clean filters guarantee—

1—Maximum cleaning efficiency in the air

2—Minimum resistance to air flow through the system

The condition of the filters can be very readily determined by visual inspection. If the filter surface is completely matted and if the filter is packed with dirt and lint from surface to surface, then the filters either should be cleaned if they are of the cleanable type, or should be replaced.

While it is possible to determine the resistance set up by filters by check with the draft gauge, such checks are not necessary in ordinary service because dirty filters should be cleaned or replaced, no matter what the draft gauge shows.

For the purposes of explanation to the customer, the furnace dealer should be acquainted with the resistance established by typical types of filters and should be able to illustrate his claims. Fig. 1 accompanying from the University of Illinois Research Residence shows the pressure losses in inches of water according to the total air quantity passed through the filter for five types of filters. Fig. 1 is for *clean, new* filters and will show progressive resistance increases as the filter begins to get dirty.

The result of a service test of filter No. 1, made over a period of 26 days of continuous operation is shown in Fig. 2. In this case, the fan was operated intermittently under control of the room thermostat in response to the heat demand on the house. Fig. 2 shows vividly that there is a progressive increase in the resistance of, or the pressure drop through, the filter as the 26 days of the test passed. In the 26-day test, the pressure drop increased from 0.13 inches of water to 0.18 inches of water or an increase of 38 per cent.

In terms of air delivery, with the fan operated at constant speed, the volume of air delivered decreased from 1,725 cfm to 1,575 cfm, or a decrease of 9 per cent.

The summary of the effect of dirty filters can be explained to the home owners as follows:

1—The increase in filter resistance imposes a larger resistance on the fan which decreases fan air delivery.

2—This decrease in fan delivery will in most types of fans unload the fan so that the electric power requirement for the motor will be smaller.

3—The decrease in air volume through the furnace will tend to increase the register air temperature, resulting in shorter cycles of operation.

4—When the filter resistance gets high enough, the complete system will be unbalanced and poor heating results will follow.

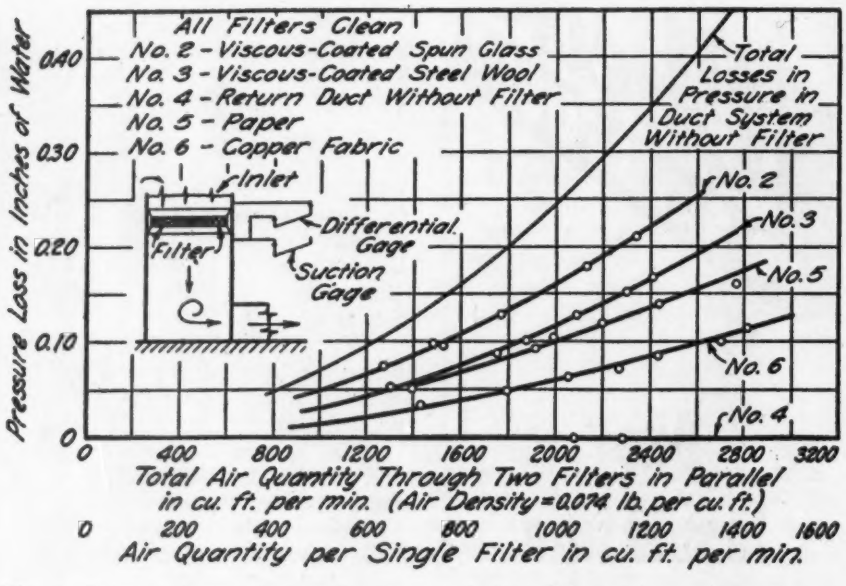

All Filters Clean
No. 2 - Viscous-Coated Spun Glass
No. 3 - Viscous-Coated Steel Wool
No. 4 - Return Duct Without Filter
No. 5 - Paper
No. 6 - Copper Fabric
Inlet
Filter
Differential Gage
Suction Gage
Total Losses in Pressure in Duct System Without Filter
No. 2
No. 3
No. 5
No. 6
No. 4
Pressure Loss in Inches of Water
Total Air Quantity Through Two Filters in Parallel in cu. ft. per min. (Air Density = 0.074 lb. per cu. ft.)
Air Quantity per Single Filter in cu. ft. per min.

Fig. 1—Pressure losses through four types of clean filters at increasing volumes.

SHEET METAL SECTION

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Temporary Dies and Fixtures

(For a War Product—Diluting Tank)

By Ernest E. Zideck
Sheet Metal Consulting Engineer

AWARDED a contract for five hundred Oil Diluting Tanks for marine use, a sheet metal shop was confronted with the problem of *tools* with which to manufacture the tanks to specifications on time and economically enough to make a profit on the deal. As re-orders were problematical, and because the quantity of five hundred of the product did not warrant large expenditures, the answer was, as in the cases of hundreds of similar small quantity war orders, *temporary tools made up in the sheet metal shop itself.*

In this connection the author wishes to emphasize the fact that the tools, dies and fixtures shown and described in these articles are presented not with the idea of imitating the above shop and making oil diluting tanks, but rather to acquaint the reader with the feasibility of temporary tool construction in one's own shop for whatever similar or dissimilar product the shop might figure on making.

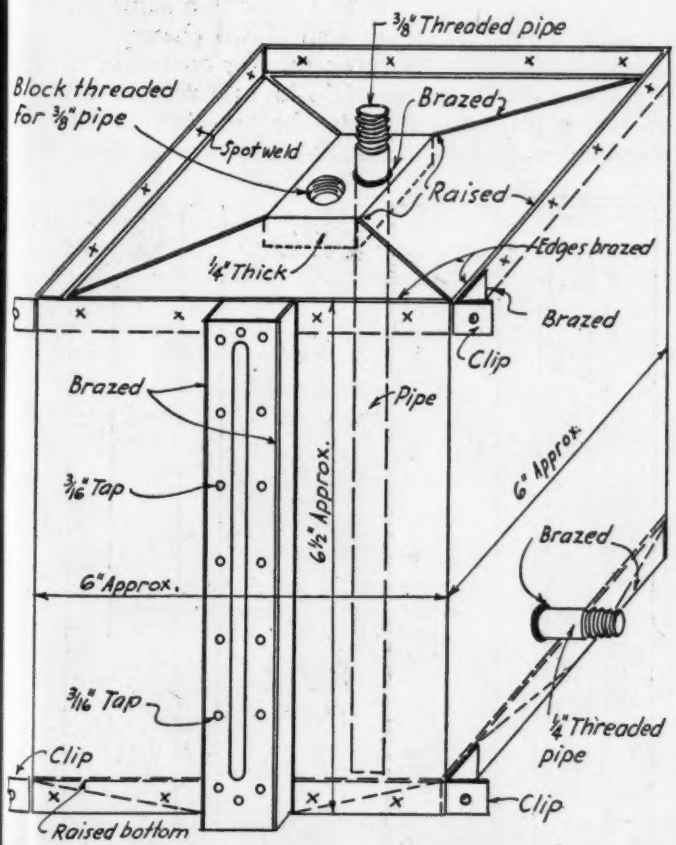


Fig. 1 Oil Diluting Tank

Viewing the oil diluting tank in Fig. 1 of the drawings, we see that it is of a size about six inches square by about six and one-half inches in height. The body is 16 ga. steel and the top and bottom are 18 ga. Both the top and the bottom are of the "inset" type, the central portion raised to about 1/16 in. less than are the flanges. The flanges are tack-spotwelded in the tank assembly, and the two thicknesses of metal are acetylene welded or brazed at their edges. The top and the bottom are of the same size and construction, making it possible to use only one set of forming dies for both. It will be noted that the central portion of the top is level, receiving a 1/4 in. thick steel plate brazed to it on the inside. The corners in the blanks are notched out, making for easier forming, and the joints are welded or brazed in assembly.

Tank Body Construction

There is but one hole provisioned in the tank body, receiving the 1/4-in. threaded pipe nipple. The tank body is not joined, but its ends are upturned one-quarter of an inch to the outside of the tank, the opening between the upturns receiving the 5/16-in. thick steel bar, slotted for a "window," shown in the drawing. This steel bar is drilled and tapped for 3/16-in. round-headed bolts. A 1/8-in. thick plate, shown in Fig. 3, fits over the bar and has corresponding 3/16-in. drilled holes. The 1/4-in. steel plate fastening to the inside of the tank top is drilled for two holes, one receiving a standard 3/8-in. pipe and the other *tapped* for 3/8-in. thread. The four 16 ga. lugs or brackets shown fastened to the front portion of the tank complete the tank particulars.

The tank is a simple construction. The one hole in the body (Fig. 1) can be punched with most any common tool. If we have a punch press and a die-set for punching the hole, a simple angle iron arm fastened to the punch press can be fashioned for a gage keeping the blanks in position for hole punching. If there is no punch press, we might make an arrangement for punching the holes in the press brake. And if there be no press brake and we want to drill the holes, five or six blanks may be clamped together for drilling at one time, pre-drilling with 3/32-in. drill and finishing with 3/8-in. or more, as required. The forming of the tank body can be done on any kind of brake, although a press brake will facilitate

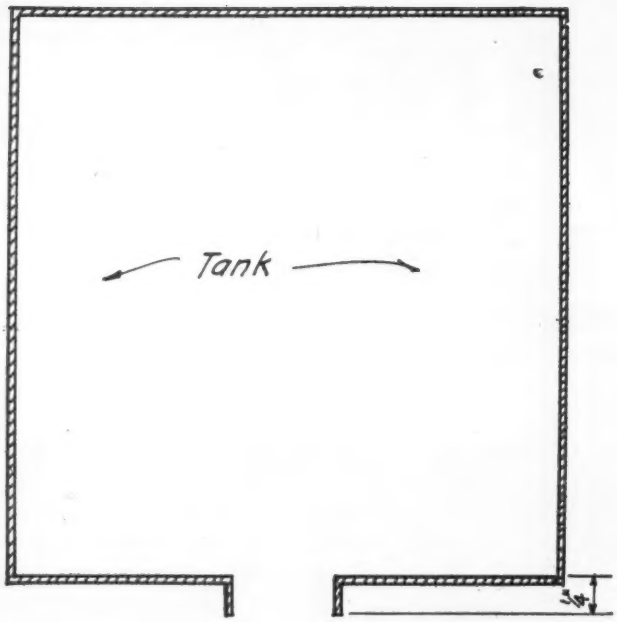
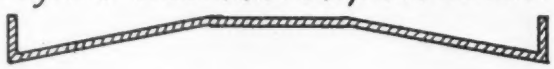


Fig. 2-A 18 Ga. Raised Top and Bottom



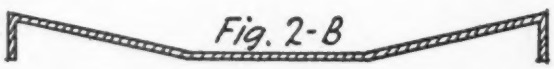
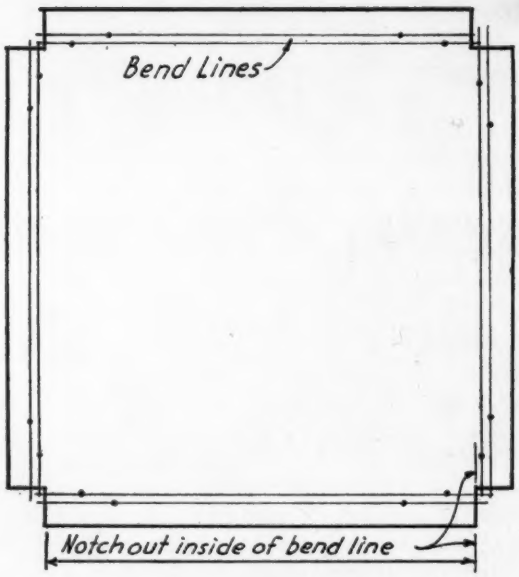


Fig. 2 16 Ga. Steel Tank Section



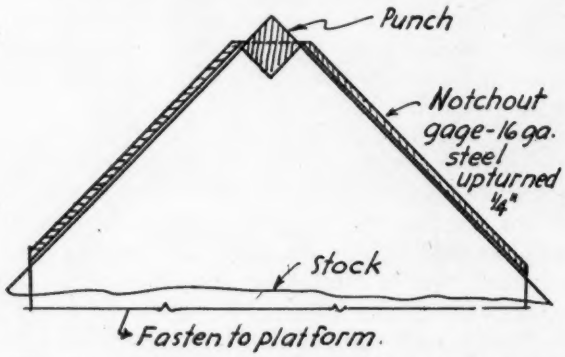


Fig. 2-C Top and Bottom Blank Notchouts

gaging and several brakings at one stroke (several men can handle the blanks).

The bolt holes in the clips or brackets (Fig. 1), there being four required to each tank, can best be punched, but in the absence of a punch press it would pay us to construct a drill jig about a foot long similar to the one shown in Fig. 8, though simpler, inserting longer strips of metal and drilling holes adequately spaced in the strip, cutting the strip to correct size pieces afterwards. The braking of the clip must be done by gage-setup, assuring of a specified dimension between the holes when the clips are positioned on the tank.

Top and Bottom Temporary Dies

The problems arise with the contemplation of the raised top and bottom, and more so of the *slotted* 5/16-in. steel bar and ⅛-in. plate fitting over it. Though the forming of the flanges in top and bottom is not difficult after the notching of them has been done (see Fig. 2-C), the peculiar central portion of the *raised* metal precludes the raising being done by common braking from corner to corner and across. Here we need a special tool, a "die-set," and Fig. 7 illustrates a simple ¼-in. steel construction, acetylene or arc welded. All we need to build this die-set is a hacksaw to do the sawing of the pieces. Obviously, a metal saw or a band saw will save time.

The die-set shown in Fig. 7 is made to operate in the press brake, but it will work in a sufficient capacity punch press as well if we change the prongs or shafts to fit the press. For operation in the brake we use pieces of ½-in. cold rolled steel or boiler plate to simulate the "insets" of the standard press brake dies. We use several ¼-in.

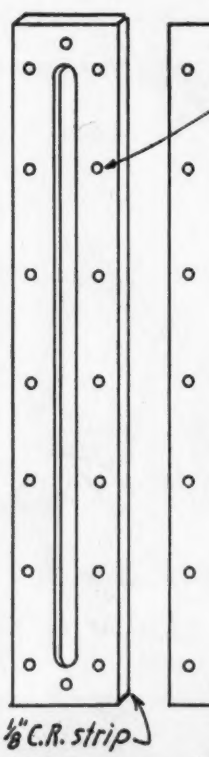


Fig. 3

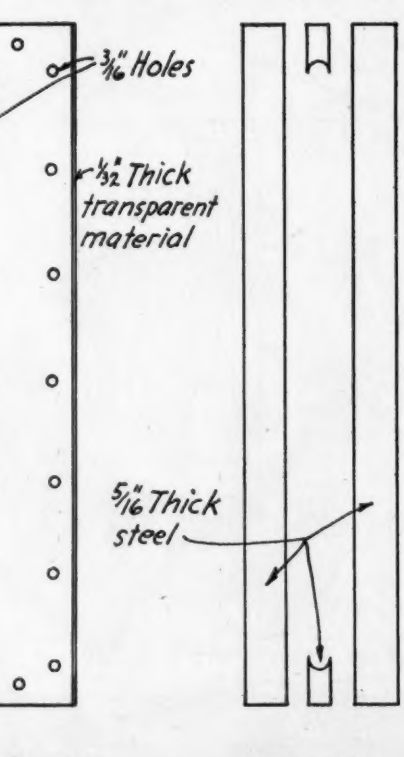


Fig. 4 Fig. 5

steel brackets extending laterally from the brake die hold to center the action of the press. The ½-in. thick steel or boiler plate is several feet long, long enough to permit its being bolted tight into the brake hold. In all other respects Fig. 7 is clear enough to show the simple construction.

In the back and at the side of the female die are bolted strips of metal serving for gages to position the blanks. The top of the female-die frame shows rounding-up, the radial and smooth portion of the frame permitting of the blank sliding easily over it. In a lesser degree the edges of the male die are rounded. Needless to say, the welds must be good, and they must be filed or ground off where there is contact with the blank. Difficulty has arisen with this die—the compressed blank within it can get stuck. That has been alleviated by drilling through the ¼-in. plate on top of the female die and through the ½-in. steel under it deep enough to permit of coil spring insertion in the hole. The spring helps to eject the formed part out of the female die.

Sight Glass Cover Construction

In Fig. 5 is shown how the problem of the *slotted* steel was solved. Both the 5/16-in. and the ⅛-in. thicknesses (the latter shown in Fig. 3) were made of four pieces each, the inserts of Fig. 5 *brazed* in. Because of the brazing being done along the edges of the "window" where it fastens between the two metal upturns, a smooth grinding-off of the upper surface is required. And while this is done, the finishing off of the brazed-in inserts is accomplished, leaving the bar surface level and smooth for the transparent material to be bolted to it.

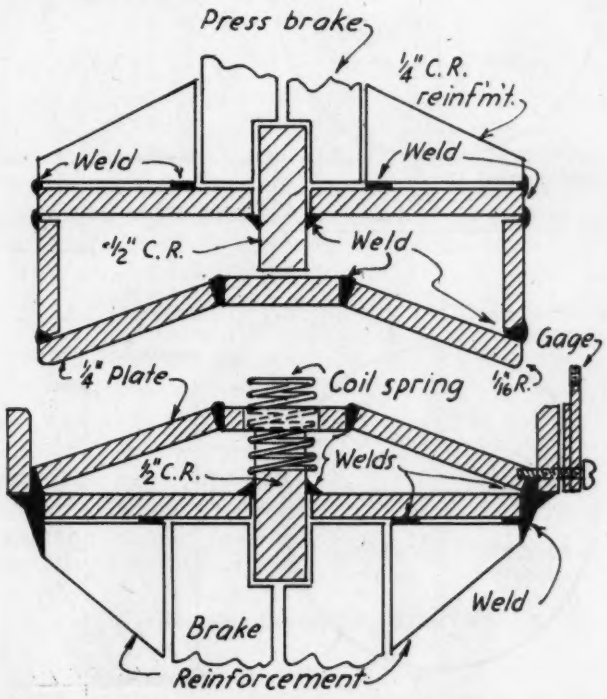


Fig. 7 Top and Bottom Forming Dies (Shop Constructed)

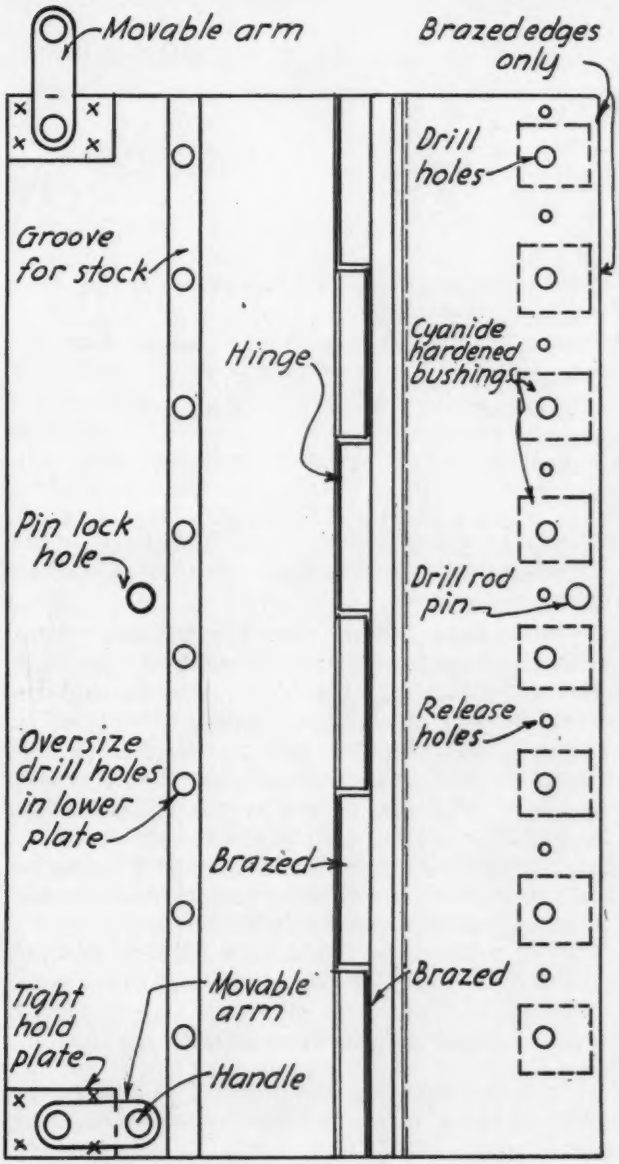


Fig. 8 Multiple Drill and Cutoff Tool

The procedure is to cut the pieces of steel to length, get the "inserts" prepared in the fixture shown in Figs. 8 and 9, arrange the pieces in the fixture Fig. 9-A, and braze the inserts in solidly. The fixture 9-A will hold the pieces in the required width and facilitate brazing at the ends of the inserts. The top surfaces of the inserts are brazed together with the window being brazed into the tank upturns. Before inserting the stock (one layer of the ⅛-in. and one of the 5/16-in. thickness) into the fixture 8 or 9, the lengths of the stock are run over a grinder taking off the

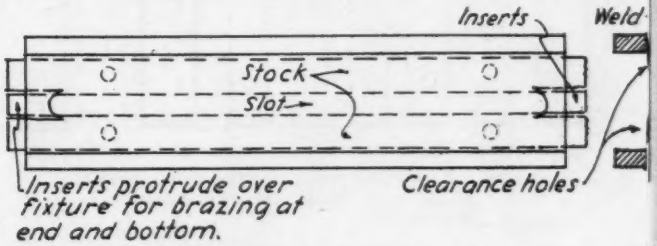


Fig. 9-A Brazing Fixture

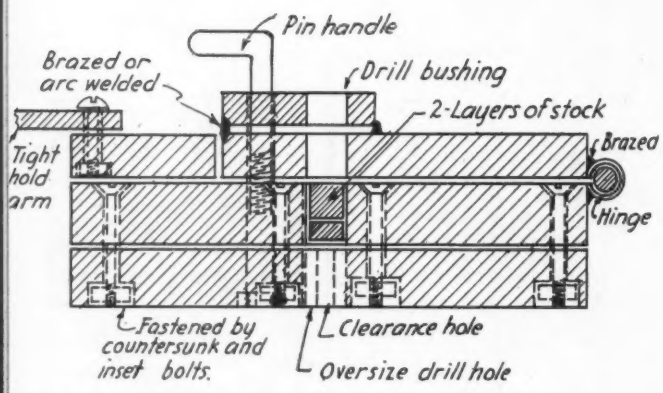


Fig. 9 Enlarged Section of Drill and Cutoff Tool

corners to a depth of 1/16-in. This bevel in the inserts renders brazing that much easier and its hold more secure.

The cutting off of the inserts after holes through them have been drilled in fixture 8 is done as follows: (a) the drilled holes through the 8 or 9-in. long stock have separated it into about 1-in. lengths; (b) drill rod is inserted through the outermost hole in Fixture 8, the fixture locked; (c) the short pieces of the stock are pressed into the gap in the fixture, tight against the drill rod; and (d) the fixture with the stock in it is put on the bandsaw platform, with the stock at the end of the fixture moved against the blade. In absence of a bandsaw, the fixture may be clamped into the vise and the stock cut off by a hacksaw.

Sight Glass Cover Drill Jig

Fig. 9-B discloses a drill jig used in drilling the series of holes in the "window" and the covering plate, tapped for 3/16-in. bolts. The jig consists of two parts, one serving for holding the stock in place and the other, fitting over it, provided with strips of cold rolled steel containing the accurately spaced holes, countersunk to 7/32 in. on top, cyanide hardened before tack-welded to the edges of the underlaying plate. The retaining fixture is made to receive and hold one 5/16-in. and one ⅛-in. thickness of stock, the window and the cover being drilled at the same time, assuring that the holes will fit one another. The holes being drilled undersize for tapping, it is necessary to re-drill the cover holes to 3/16 in. additionally. (In brazing the window to the ¼-in. tank body upturns, the flame is held so as to heat the edge of the stock but not the entire surface of the steel, guarding against the window warping and damaging the holes.)

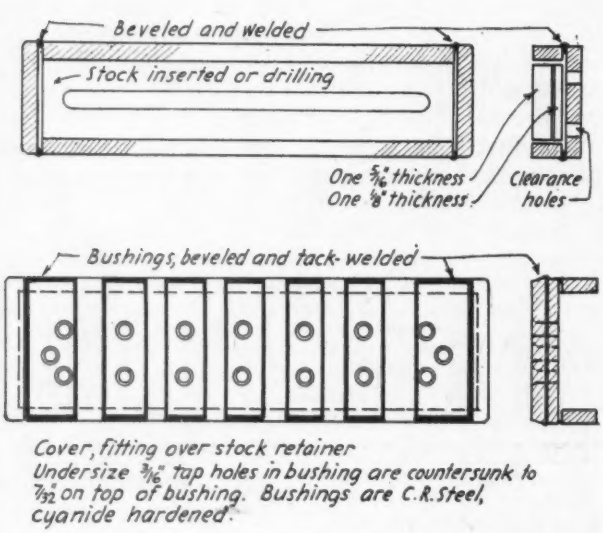

Beveled and welded
Stock inserted or drilling
One 5/16" thickness
One 1/8" thickness
Clearance holes
Bushings, beveled and tack-welded
Cover, fitting over stock retainer
Undersize 3/16" tap holes in bushing are countersunk to 7/32" on top of bushing. Bushings are C.R. Steel, cyanide hardened.

Fig. 9-B Drill Jig for Window and Plate

Screen Construction

In Fig. 6 we see a standard water pipe reducer and cap. Inside the reducer is inserted a funnel made of fine mesh wire screen. There being five hundred of the funnels to make, it pays to fashion a forming tool for them, the simple arrangement illustrated in Fig. 10 doing the job. A funnel of the size is hand-made of 18 ga. metal, the funnel open at the metal joint, with a strip of 20 ga. steel brazed inside, as shown. It is best to braze this strip in before the forming is done. The edges of the 18 ga. metal are filed to a bevel so that the wire screen will slide into the slot easily without a "step" in the screen resulting. At near

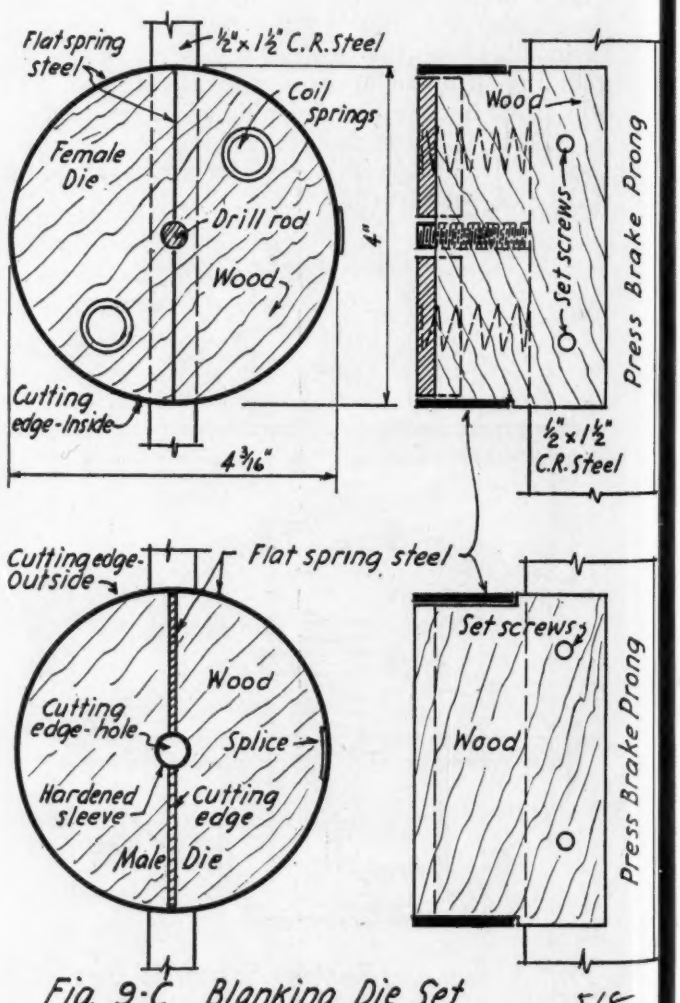


Fig. 9-C Blanking Die Set

5-18

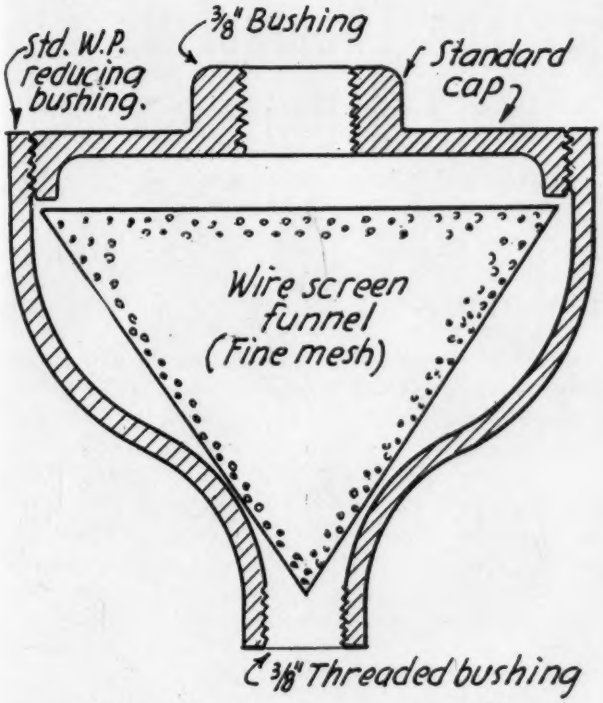


Fig. 6 Enlarged View, Oil Screener

the ½-in. diameter distance in the funnel are punched a few 3/16-in. holes. A shaft of about ½ in. diameter is inserted into the funnel and the holes serve for brazing the shaft to the funnel. But the brazing is not done until the funnel-cover has been secured to the shaft. Then the cover is fitted over the funnel, centering the shaft, and it can be welded or brazed on.

Screen Rolling Jig

A piece of ½ by 2 in. stock about 10 inches long is heated at one end and bent to the required degree, as shown. Two ½-in. holes are drilled and reamed through the bar, dimensioned for the horizontal hole to receive and hold the funnel shaft; the other hole receives and holds a piece of shafting, the shaft just a thirty-second of an inch above the metal of the funnel. This shaft is threaded at its one end and provided with a locknut. It may be moved within the hole in the bar. The funnel shaft end is also threaded for the locknut, which is tapped for a set screw, as shown. About a 1/16 in. thick washer is inserted between the funnel cover and the bar. The funnel-shaft threaded portion protruding over the locknut receives a handle to rotate the funnel. A turning machine handle fastening over the shaft by a set screw will do as well.

Screen Blanking Die

For the shearing to size and shape of the wire screen we use the die-set 9-C, operating it in the press brake or the punch press, as we see fit, the difference being only in the arrangement of fastening prongs. In Fig. 9-C is shown the familiar press brake fastening arrangement. In fashioning the *blanking* die-set for the wire screen we might make use of two pieces of flat, coiled spring steel of which there might be found sufficient lengths in any shop. The width and thickness of the springs do not matter, just so we can form the spring into the desired shape. Two wood blocks are used and the flat spring steel is fastened to the wood, one of the springs protruding over the wood. Fastening of the spring steel to wood must be by pressing the wood inside of the ring. The rings may be brazed at their joints, one (the male ring) having a splice on the inside and the other (female) having the splice on the outside of the ring. The spring steel is ground to a cutting edge, the male ring having the cutting edge on the outside and the female ring on the inside. The wood blocks are provided with fine saw cuts across, pieces of thin spring or similar steel inserted edgewise into the cuts, forming cutting blades for parting the wire screen disc in the middle.

With this shop-made blanking die thousands of wire screen half-discs may be cut in no time. With the shop-made rolling machine shown in Fig. 10 the blanks may be rolled to shape quickly. (Note that the upper shaft is inserted loosely through the bar, permitting its moving upwards for the extraction of the formed funnel.) The wire screen is lapped (the die-set providing for the lap) and soldered. The funnel is inserted into the reducer, Fig. 6, with the cap (which might need grinding to smoothness), pressing against its upper edge. The reducer is then threaded over the pipe protruding through the top of the tank. This latter operation, as also the final arrangements for the Oil Diluting Tank's performance, is attended to at the Marine Base.

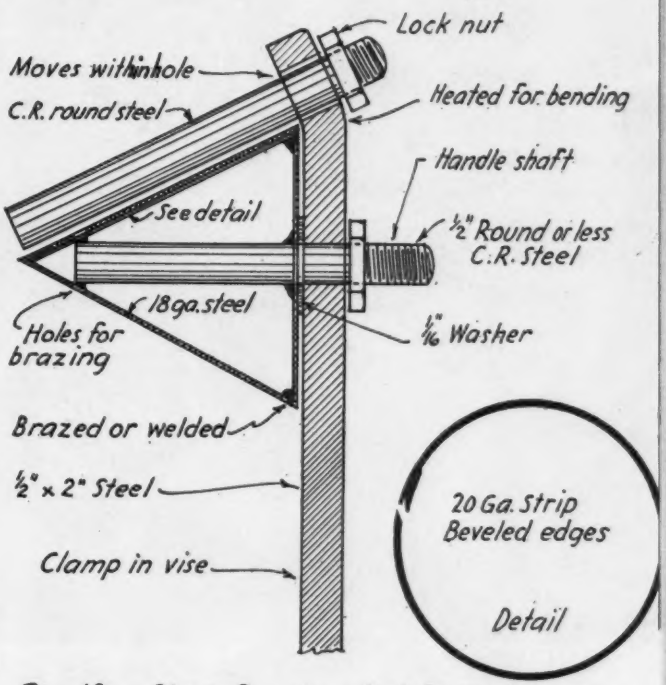


Fig. 10 Shop Constructed Funnel Former

Positioning Fixtures Pay For Themselves In Any Run Over 20 Welded Units

ONE of the consistently busiest shops in war work in the Cleveland area is The Thornton Company where during the last three years a constantly changing variety of war products have been produced in small and large quantities. On many of these products the order has been for a single unit; on other products the shop has enjoyed virtually continuous production.

Two facilities have enabled the Thornton Company to successfully complete these numerous contracts—equipment to work in heavy gauges including plate, and an unusual competency in all types of welding.

This competency in welding is inseparably tied into a certain ingeniousness in making welding easy, quick, accurate and inspection-proof. This competency and ingeniousness is probably best expressed in the consistent use of welding fixtures or positioners which make it possible to do all welding "down-hand"; with fixtures ordinarily made from material found in most fabricating shops, and built at a cost proportionate to the size of the order.

On this subject of fixtures or positioners, F. A. McCloud, president of The Thornton Company, has several definite opinions. These opinions are related pictorially to the series of five photographs which accompanies this article showing a typical Thornton war product in process of being put together.

Declares Mr. McCloud, "Where accuracy is essential for further machining or fitting of parts

Photograph 1—On the table to the right are parts of more than one base which have been sub-assembled by welding. Parts of one base are grouped in the center, foreground. Right, foreground, is a finished base. Right, background, is the frame for squeezing the base ring to receive the hinges. The fixture can be rotated to bring each weld before the operator—down-hand.

Photograph 5—A finished unit in right, foreground. Finished back in left, foreground. Accuracy must be within 1/64 of an inch. Quarter inch plate.

secured from another source or placed later, we believe that jigs are indispensable even for lots of as little as 20 units.

"When we make such fixtures, we provide allowances for warpage and warpage is compensated for. This could not be possible where welding is attempted without fixtures.

"Scrap Pile" Fixtures

"In the series of five photographs, each of the five larger fixtures was made of materials ordinarily found in any fabricating shop; in this case, material we picked out of our stock pile—often out of our scrap pile. In none of the jigs do we have invested more than 15 or 16 hours of labor in design, cutting and putting together. There is no machine work required on any of these fixtures if we can avoid it. Usually this unavoidable machining is only drilling and tapping holes for bearings, rotating shafts, etc.

"We know that machine work is expensive and even when done in our own shop ties up machines which should be or are busy on war work. So we devise fixtures requiring a minimum of machine work and we put all fixture parts together by welding, which is cheaper and faster. Our fixtures are, in most cases, built by our own workmen, using materials available in our shop. We try to have the mechanics build a fixture knowing what is going to be done in the fixture on completion, as we find this usually simplifies the final design.

"The fixtures shown in the photographs which have the feature of rotation for position welding must justify themselves by making the welding easier or quicker or which make it possible to do all welding "down-hand," and the final cost must be proportionate to the value of the contract. As a rough formula, we believe that 40 or 50 units warrant a rotating fixture. However, it is easy to see that the cost of the rotating part of the fixture is only a minor part of the cost of the job. For example, the rotating fixture shown in Photograph 3 didn't cost more than $45 complete, and to eliminate the rotating axle would not have reduced the cost more than a dollar or two.

"Moreover, our years of experience prove to our satisfaction that a $45 cost for such fixture as that shown in Photograph 3 is not an "expenditure" even in a small run, because the direct labor saved in a run of 25 units will pay several times over the cost of the fixture. And we always keep in mind that these fixtures make the finished unit more accurate and workmanlike.

"The most important conclusion we have obtained from our years of work of this type, is that the welding fixture should be as simple as possible. The second most important conclusion is that a fixture of the right type is the biggest time and cost saver we have in our shop.

"We have seen and we have built fixtures much more complicated than the fixtures shown in the

Photograph 2—Parts for a "back" on floor, foreground. Finished back right, background. Pieces are locked in the "box" which can be revolved for down-hand welding.

five photographs. Some of these more elaborate fixtures had clamping devices and an amount of machine work which ran the cost of the fixture to six or eight times as much as the simple fixtures shown in the illustrations. But these more elaborate fixtures added little or nothing to the efficiency of the welding procedure. The best fixture is that one which employs the fewest possible parts to hold the pieces to be welded in accurate and rigid alignment for easy welding—beyond that point fixture expense is wasted."

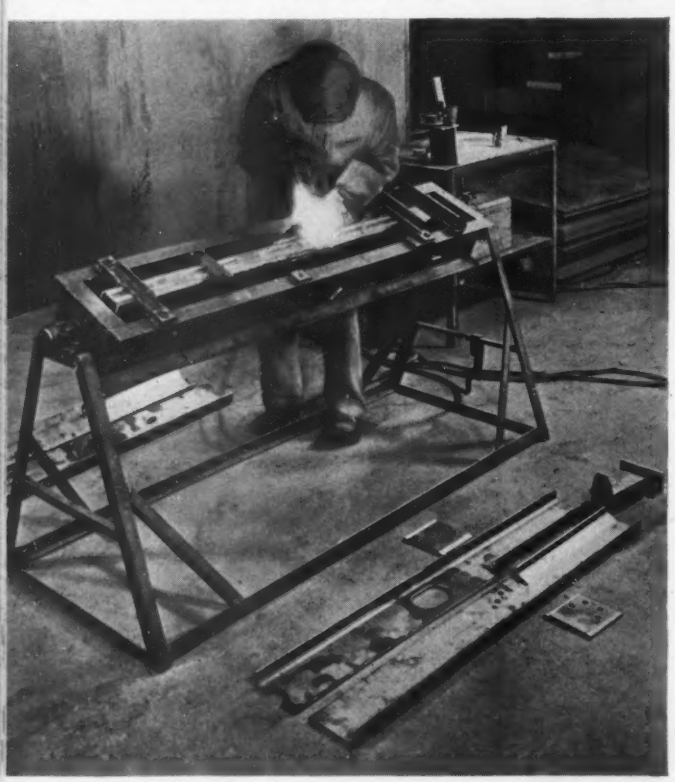
Typical Job Fixtures

The five photographs referred to by Mr. McCloud show the principal steps in welding main parts of a war product together and then, finally, welding these main parts into a finished unit.

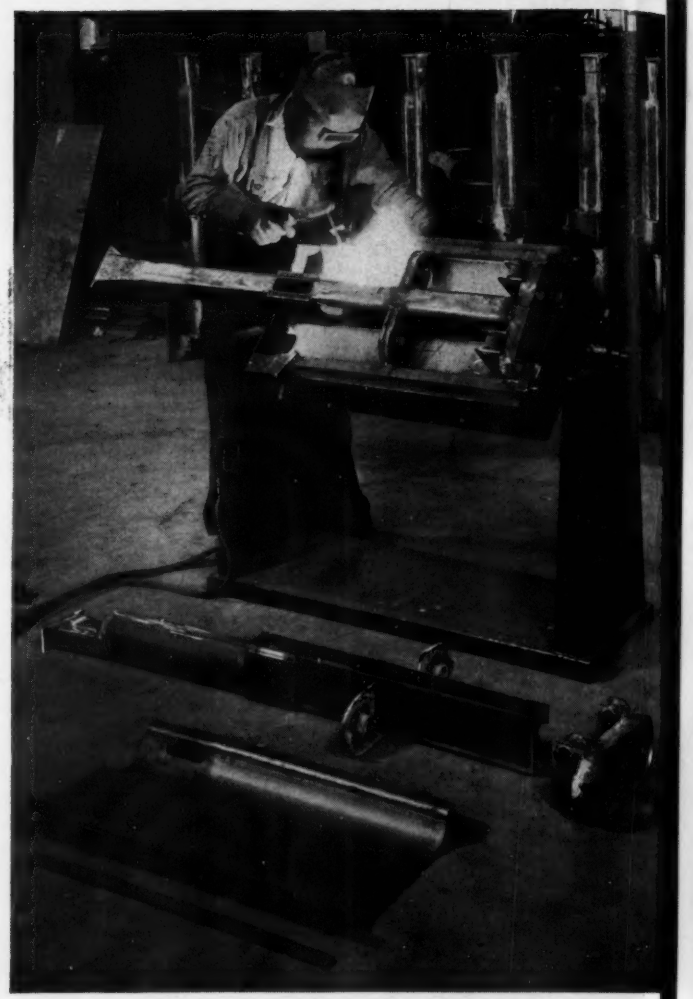
Photograph 5 shows the finished unit—an item which must be accurate within 1/64 of an inch or less, made of ¼-inch plate, and consisting of three principal assemblies.

Photograph 1 shows the base. Typical parts of the base are grouped on the table at the left, but there are more parts than go into one base. In the center foreground the required parts for one base are placed about as they go together after some minor parts have been welded together. In the right foreground is a completed base. Behind the completed base is the fixture base in which the base ring has been squeezed ready for the hinge brackets.

All these parts and sub-assemblies are placed in the jig shown under the operator's hand. The feature of this fixture is that the parts to be welded can be rotated in the standard (left to right as viewed in the photograph) and the fixture itself can be rotated so that all welding can be down-hand. This is important where small pieces and sub-assemblies must be welded together.



Photograph 3—Parts for a "column" on floor. This fixture cost less than $45.00. Trunnions permit all welding in position shown in photo. Parts are locked in place.



Photograph 4—Fixture for welding together base, column, back. Most elaborate fixture of series. Parts welded at this step are shown in relative position on the floor.

Photograph 2 shows the parts of the "back" placed on the floor in approximately the relationship in which they are assembled in the fixture for welding. Standing on end at the right is the completed "back." The fixture, in brief, is a box of channels in which the back plate and the small inserts rest while the sides of the "box" hold the stiffening bars and the top piece in position. In this fixture the locked-in-place pieces can be turned over for welding inside or outside the back sheet.

Photograph 3 shows the "column" of the unit being welded in the rotating fixture. The pieces which make up the column are placed in relative position on the floor. The fixture is also a "box" built up of channel with a shaft stub on each end to permit the "box" to be rotated.

Photograph 4 shows the most elaborate fixture in the procedure. In this fixture the sub-assemblies produced in fixtures 1, 2, 3 are put together along with some minor parts. This final step requires welding from only two sides so the assembly can be turned over, but not up-ended. The three main parts which are welded together at this step are shown laid out on the floor.

To Cooperate with the Government Fuel Conservation Program

REPAIR FURNACES NOW!

The Federal Government is launching a huge nation-wide fuel conservation program. To successfully cooperate in this movement, the first step is to put furnaces in good working shape so that they will give uniform distribution of heat with minimum fuel consumption.

Do your part by urging your customers to *repair furnaces now!* Now, when furnaces are idle, is the time to check every Rybolt furnace in your community and urge owners to have them cleaned and repaired if necessary.

But be sure to get genuine Rybolt repair parts... made from original patterns with quality materials. Your customers will find them dependable because they are identical with parts used in the original Rybolt units.

Take advantage of this opportunity to develop profitable business for yourself and to help your government.

To replace furnaces which are absolutely beyond repair, we can supply a limited number of Rybolt units under Government order P-84.

Save or Slave—
Buy War Bonds

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ **ASHLAND, OHIO**

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION

Says

Air Filters Play Important Role in Maintaining Health and Business

C. L. Rowley
Publicity and Merchandising Committee

WARM air heating contractors are faced with an obligation to help protect the health and property of the public by providing efficient maintenance and repair services.

An important factor in servicing all forced warm air heating units is the installation and proper maintenance of the air filters. The condition of the filters has a direct bearing upon the householder's heating costs, the amount of fuel consumed, and his ability to maintain comfortable temperatures in his home under war-time conditions.

Clean Filters Essential

Only a properly functioning filter can efficiently remove dust and pollen from the air circulated by forced warm air furnaces. Further, clogged filters, in addition to reducing the circulation of air and the delivery of heat, may cause overheating and failure of the blower motor—a serious matter in these times when replacement parts are difficult to obtain, and even when obtainable often involve a long delay.

All this boils down to the fact that to get a maximum amount of heat from a minimum amount of fuel the air filters must be kept clean. In the case of replaceable types, filters must be replaced at least once each year, preferably before the start of the heating season. If the system operates as a cooling and ventilating unit during the summer months, filters should be replaced both in the spring and in the fall.

The fuel shortage—which may be more, rather than less, severe next winter—the publicity given to difficulty in obtaining replacement parts, and national advertising emphasizing the importance of clean filters, have all combined to pave the way for the heating contractor who is prepared to take advantage of the opportunities for more business that are provided by the installation and maintenance of filters.

THE author of this discussion of the importance of filters, points out how clean filters mean fuel saving through better air circulation and better health. We suggest that readers refer also to page 54 in our special Fuel Conservation Section (page 39) where an engineering analysis of filter service is presented. Also, to the other articles in the same section on other phases of fuel conservation.

Big Replacement Market

It is estimated that the replacement market for filters in 1943 will show a dollar volume amounting to $6,500,000. This in itself is an impressive sum, but experience has shown that servicing filters provides the contractor with numerous openings to sell his other services.

The coming months offer contractors an opportunity to sell householders a summer servicing job including changing or cleaning filters, checking the firing device, checking for worn or broken parts, adjusting controls, and general cleaning, painting and cementing.

Canvassing will probably be out of the question. Telephone solicitations frequently show good results, but one of the best ways for the contractor to sell his all-around services is to compile an up-to-date mailing list of present and potential customers and then make use of the direct-mail selling aids that are offered by filter manufacturers.

These selling aids are usually designed to sell not only filters, but the contractor's other services as well. They frequently open the door to a permanent and mutually satisfactory customer connection.

What has an Air Battle to do with Automatic Heating?

When a fighter pilot streaks "upstairs" to meet the enemy, there comes one tense instant upon which everything depends—the life of the pilot, the fate of his ship, maybe the success of the whole action...

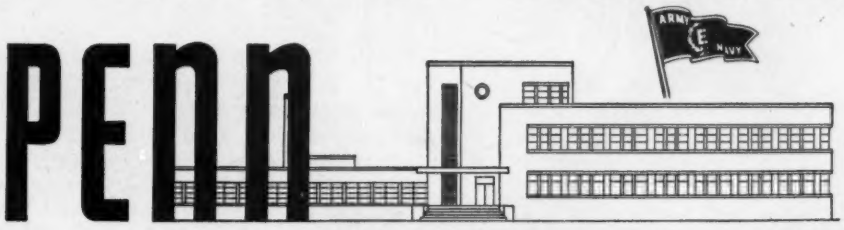
...that is the instant when he presses the electric trigger switch. In a split-second the guns must speak—or he is lost.

As one phase of our direct work for the armed forces, *Penn is producing the solenoids* for these electric "triggers." Naturally we are proud that our skill, experience and precision production facilities *qualify us* to manufacture equipment for our fighters which is governed by extremely high specification standards.

Because men, machines and materials must now *serve our fighters first,* fewer Penn automatic heating controls can be made—only those urgently needed to keep equipment in operation. For that we are truly sorry...we know you understand.

But remember this...out of our experience in meeting the exacting needs of fighting men, will come automatic controls to *establish new standards* of accuracy, convenience and dependability—and which will open new opportunities for profit to you in a tremendous post-war heating market.

That is what an air battle has to do with automatic heating. *Penn Electric Switch Co., Goshen, Indiana.*
In Canada: Powerlite Devices, Inc., Toronto, Ont.



PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

ISTORY OF THE

NATIONAL WARM AIR HEATING and AIR CONDITIONING ASSOCIATION

By... ALLEN W. WILLIAMS

CHAPTER 4 ASSOCIATION GOES TO FIRST WORLD WAR

AT THE conclusion of the report Professor Willard made the following statement:

"The Engineering Department of the University proposes to go ahead in a rather limited way. We have about $2500 or $3000 invested at the present time. Under present war conditions we cannot do much. We have been working nights and Sundays to be ready to show you that we can measure temperatures and velocities. The contract between the University of Illinois and the Association has been drawn up, and we are ready to talk business with you.

"I do not know as this is the opportune time to present this. It may be possible to put it off for a year. We are agreeable to that. I do feel that you can, by your assistance and cooperation, make these tests far more comprehensive and more valuable to the furnace heating industry, and that you can do a work that is of direct benefit to your Association, and each member of it, as well as do something to establish correctness in respect to furnace heating as a means of heating buildings. I am a friend of furnace heating. We hear very little about the furnace now.

"The War Department knows almost nothing about the furnace today. I don't know how far we can go. I am willing to go as far as to put my supervision against your money behind these tests.

"You must realize one thing at once, and I wish to make it very plain, that if it is to be purely an advertising proposition at the present time you better stop right where you are. It is a big undertaking that we are proposing to you. We at the University can do a little. We cannot begin to do as much as we can with your cooperation. I think, eventually, you will all profit by it in a business sense. To the engineer it appeals most from the scientific standpoint. Whether you act now favorably, or later, I hope we can have the support of an Association of this sort, that is peculiarly interested in this particular form of heating, and that we may get together on some basis."

After this statement by Professor Willard the Association unanimously voted the acceptance of the proposition as made by the University of Illinois and thus was commenced the Warm Air Furnace Research which has now been continuous for twenty-five years proving more necessary and helpful each year and regarded as so essential that even during depression years it was carried on without interruption. More than a quarter of a million dollars has been contributed to this important activity by the Association to say nothing of the inestimable contribution by the University of Illinois and its engineers, and the time and talent given by individual members of the Association.

It is an interesting fact that it was the sincere opinion of a number of the members of the Association that not more than two years would be required to complete the proposed research and investigate all phases of the warm-air furnace. Those who shared that idea were not prejudiced or at all opposed to the proposed research. They simply missed their guess which is not at all surprising.

A Committee which was known as the Research Advisory Committee was promptly appointed as follows:

J. M. McHenry, Detroit, Michigan
P. J. Dougherty, Utica, New York
Walter Wimmer, St. Louis, Missouri
R. C. Cook, New York City
E. S. Moncrief, Cleveland, Ohio

Some of these men were heating engineers, others identified with the commercial side of the industry and others experienced in the installation of furnaces. Both steel and cast furnaces were represented.

The personnel of the Research Advisory Committee has always had a great responsibility and its members have been loyal and talented men who have given liberally of their time and money.

First World War

It was in April, 1917, that the United States declared war against Germany and World War I was on. Shortly there were many rumors to the effect that much would be needed by the Government in the way of equipment for heating its cantonments but nothing definite developed until Quartermaster General Sharp suddenly wired the Association's office to immediately advise price and delivery dates for between twenty and thirty thousand warm-air furnaces. The message gave no information as to size nor was any other detailed information given and it was a lot of furnaces.

Hurried long distance calls made it possible to arrange for a few of the furnace manufacturers and their engineers to meet in Washington for consultation, secure information as to what was needed and to report to all the furnace manufacturers in the country. It was a group of eight or ten who gathered in Washington at the Raleigh Hotel within thirty-six hours and Frederick Will of Rochester, N. Y., whose company was a member of the National Warm Air Heating and Ventilating Association, and manufactured both furnaces and stoves, consented to act as their Chairman.

After the Committee had learned the number and kind of buildings in the war camps which the Government must heat, it estimated that as many as 60,000 furnaces might be required. It was learned that these furnaces would be used as room-heaters and must be built accordingly; that is, they must set on legs, be cased as room-heaters and be made of cast iron, as steel was needed for other war purposes.

As other methods for heating the cantonments were being considered the Government authorities were next persuaded to defer placing their order for heating equipment until a sample of such a furnace or room-heater could be hastily constructed and submitted to the Government engineers for approval. A quick delivery of such a sample was made possible through an offer by W. L. Dawbarn, representing the Thatcher Furnace Company, New York City, to have the sample constructed in the Thatcher plant within twenty-four hours and forwarded by express to Washington for inspection.

Unfortunately the first sample was lost in transit but the second sample arrived safely and in a general way proved acceptable to Government authorities.

It should be added here that a little later the Association was fortunate enough to have Professor Willard consent to act in an advisory capacity with the Government engineers and guide them in preparing final specifications for the type of room-heaters best suited to the Government's needs. It is needless to say this afforded the very best engineer talent available and the specifications prepared were accepted by the Government.

The Governmental authorities were also persuaded to wait until the industry's representatives, still in Washington, could secure facts and figures from the various furnace manufacturers as to whether or not the furnaces of certain needed sizes could and would be furnished within ninety days at fixed prices.

A telegram was prepared by the committee giving the limited information available as to the sizes required and the price which the Government would pay and was sent to every furnace manufacturer in the country, whether members or not of the National Warm Air Heating and Ventilating Association. All deliveries of the 30,000 room-heaters, which the Government ordered during the ensuing twelve months, were made on time.

The result was that eleven of the sixteen Government cantonments were heated with warm-air furnaces and that the results which our Government obtained from these room-heater furnaces were reported as satisfactory.

It was in June, 1917, that D. Rait Richardson of New York City succeeded John D. Green of Detroit, Michigan, as the Association's president.

During the war, the furnace and stove industries worked together in their contracts with the Government, a War Service Committee being formed with Frederick Will of Rochester, New York, as Chairman. However, the furnace industry and the stove industry each had its own and separate War Service Committee for handling matters of particular interest to each.

It was during 1917 that the furnace industry received its introduction to priorities, allocations of materials and the simplification of styles and sizes, also the possibility of substitutes for some of the materials which the industry was using. In short, they learned what war meant to industry.

Conditions in industry were to a limited degree comparable to those existing during the second World War. For instance, manufacturers were told that there was not material enough to supply the needs of the Government; therefore, they would receive only what was left. The reaction of the furnace industry which was reflected through the Association was, "we are willing to do everything which our Government either desires or orders" and that policy was followed until the end of the war. However, the War ended before it was necessary for the Government to enforce priorities or allocations to any material extent on the furnace industry.

During World War I, the Conservation Division, the Industrial Board and the Priority Board of the Government at Washington were needing information as to the amount of each and all materials used by the furnace industry and also reliable data as to the number of furnaces manufactured and sold during 1915, 1916 and 1917, so the furnace manufacturers were told by the Government that materials would only be allocated to manufacturers who furnished the information desired and the Secretary of National Warm Air Heating and Ventilating Association was

(*Continued on page* 87)

In the preceding Chapter the contract for co-operative research with the University of Illinois was presented to Association members. This Chapter concludes the discussion and acceptance of the contract and the first Research Advisory Committee is appointed. Just at this time the U. S. entered the first World War and we see that many of the conditions confronting the industry now in the second World War were experienced back in those days.

Left: W. G. Wise, Akron, Ohio, assumed the presidency in 1918 when Mr. Richardson was called to Washington in government war work. Mr. Wise also served as president of the association from 1919 to 1921.

Right: D. Rait Richardson, New York City, was elected president in 1917—the association's second president.

New Products

For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 76 and mail to us.

△ Indicates manufacturer not listed in 1942 Directory.
● Indicates product not listed in 1942 Directory.

• 39—Rivnut

The B. F. Goodrich Company, Akron, Ohio, has developed the Rivnut, an internally threaded and counterbored tubular rivet which can be headed blind, primarily for use as a nut plate in the attachment of its de-icers to airplanes.

With a great many other applications, both on airplanes and in other industrial fields, the company has now published a 12-page manual on the Rivnut with complete description of the Rivnut in standard countersunk and flat head types. The grip range is given, instructions for applying the Rivnut, two pages of charts giving all essential data, a description of both power driven and hand tools for applying, tables on typical ultimate strength, strength in double shear with no reinforcements, torque resistance of Rivnut keys, thread strength, shear and tension tests, and a page devoted to Rivnut weights.

◆

△ 40—Wet Cutting Saw

Johnson Manufacturing Corporation, Albion, Michigan, and Chrysler Building, New York City, has designed a new wet-cutting model Johnson metal saw for high-speed cutting.

Pump is non-clogging piston-type, driven by noiseless cam; mounted in frame without impairing overall

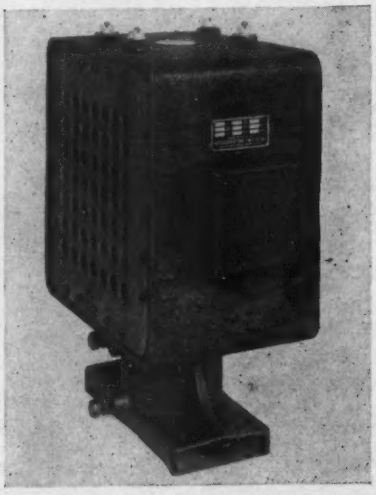
streamlining of machine. Power taken from present drive gear, eliminating necessity of separate motor. Ingenious power take-off eliminates special wiring and extra switches. Speed of pump is regulated by speed of machine; flow of coolant is in direct relation to blade speed. Pump automatically stops and starts machine; steady flow of coolant insured through use of ram which smooths pump impulse.

For dry cutting, pump can be disconnected.

Johnson saws now in use can be equipped with coolant feature.

△ 41—Solenoid for Welders

Hercules Electric & Mfg. Co., Inc., 2416 Atlantic Avenue, Brooklyn, N. Y., announces a new type of solenoid especially designed for electrically op-



erating the arms of spot welders. Laborious footwork is transformed into the pressing of a button for increased production.

Solenoid action produces constant, uniform pressures much greater than possible with foot pressure. Pressure is instantaneous.

The unit can be easily and quickly attached to all makes of spot welding machines. Units can be provided with or without automatic timers.

◆

△ 42—Multi-Flanger

Riverside Machinery Company, 10632 S. Michigan Avenue, Chicago, is introducing the Riverside Multi-

Flanger for the production of flanged edges or strips.

The Multi-Flanger will handle sheet metals of almost any practical gauge, and work on straight edges or around shapes, such as the edges of discs, or around inside and outside edges of circles. The metal is not scored, marked or mutilated in any way.

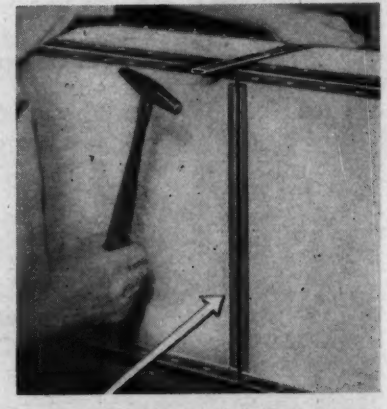
Small, inexpensive dies are used with the Multi-Flanger, interchangeable, making the machine extremely flexible in changing from one job to another. The head is adjustable to provide a wide range of operations.

The machine requires only 4 square feet of floor area for installation. Bulletin No. 123 is available.

◆

• 43—"U" Metal Strip

Sheetlock Company, 4521 North Clark Street, Chicago, has just put on the market a new metal "U" strip —a simple way of joining two rectangular non-metallic ducts effectively. The "U" strip is U in shape, and has notches in the channel which grips and holds to the sheet board. It is self-fastening, and is easily pushed into position on each of the four sides



Drive cleat locks the "U" strips together. Arrow points to two parallel "U" strips.

of the end of each duct to be joined. A drive cleat is then driven over the top side of the two parallel "U" strips. This is done on each of the four sides, and holds the two ducts together securely.

This method eliminates the necessity of having each of the duct ends exactly alike, especially the corners, for easy fabrication.

The usage of the drive cleat with the new "U" Sheetlock Strip overcomes one of the major problems in working with non-metallic sheets.

Sheet Lock can be obtained from jobbers without priority.

A LOT OF DEALERS have already set new, high records for Dust-Stop Filter sales in the first six months of 1943. But bigger business and profits are still ahead . . .

This is because the greatest national magazine advertising campaign in Dust-Stop history is about to get under way. Monthly advertisements will run in Life, Better Homes and Gardens, American Home, and other leading magazines. And, the biggest set of Dust-Stop dealer helps are still to be mailed to prospects.

Here's how to assure greater Dust-Stop profits

First be sure that you mail out all of the folders and post cards according to the Dust-Stop Timing Chart. Display Dust-Stops prominently beside the new colorful window and floor display cards. Insert the newspaper advertisements in your local papers. Also clip and display the national advertisements as soon as they appear.

And finally, be sure you have an ample supply of Fiberglas* Dust-Stop Air Filters on hand.

People well know about the importance of heating efficiency this year. More than ever they are going to want all their forced-warm-air heating equipment to be in A-1 condition to save fuel.

Dust-Stops alert advertising and dealer-help campaigns head this business toward your door.

And, in addition to filter-replacement profits, you get furnace-repairing and cleaning jobs, too.

So, if by any chance you have not already obtained the great 1943 dealer-help campaign, don't delay, call your distributor today. Ask him to send you full details about "Pulling Profits Out of the Air."

Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.

FIBERGLAS*

DUSTOP*

*T. M. Reg. U. S. Pat. Off.

AIR FILTERS

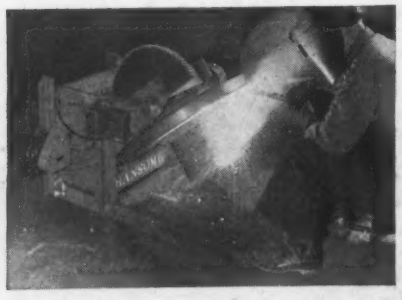
New Products . . . . . .

For your convenience in obtaining information regarding these items, use the coupon on page 76

44—Welding Positioner

Ransome Machinery Company, Dunellen, N. J., has designed a new 500-lb. welding positioner—to handle loads up to 500 lbs. with the center of gravity of load 6 inches away from the table top and with a 6-inch eccentricity.

The positioners are available in hand or motor operated models. The motorized unit includes a Reeves



variable speed drive providing a speed range of up to 1 rpm of the table top. Tilting range is a full 135 deg. from horizontal or 45 deg. beyond vertical providing the "down under" position for all downhand welds.

The 26-in. diameter circular table top is T-slotted, simplifying the clamping of work to it. All gears are of the cut-tooth type. The machine can be furnished with a regular base for bench work or with a sub-base giving a height adjustment from 27 up to 42-inches from the floor line to the table top. A clutch arrangement permits free rotation of the table top by hand. The motorized units can be supplied with a hand wheel in lieu of a motor for tilting, if desired.

Bulletin No. 199 is available.

◆

45—A. C. Electrode

Harnischfeger Corporation, Milwaukee, has introduced a new all-position electrode coincident with their new line of P&H A.C. industrial arc welders, designed especially for use with A.C. transformer welding machines. Suited for all mild steel applications, it is being made in the usual sizes of ⅛, 5/32, 3/16, ¼, and 5/16 in., and 14 and 18 in. lengths, packed in standard 50-pound containers. Detailed information and welding procedures are available.

Right-hand section shows dark color of Turco Redi-Paint.

△ 46—Redi-Paint

Turco Products, Inc., 6135 South Central Ave., Los Angeles, offers Turco Redi-Paint for preparing galvanized surfaces for permanent paint adhesion.

Turco Redi-Paint passivates or "cools" the "hot galvanizing" so that paint will hold. Painters call galvanizing "hot" because it burns the paint and causes it to separate from the metal. Paint peels or chips from it due to two causes: (1) the smooth, spangled surface, and (2) the alkaline surface condition (zinc hydroxide) either present at the time of painting or developed beneath the paint film by penetration of moisture in service or storage. With Redi-Paint the surface of the metal is "chemically" changed, giving a permanent protection and base for the paint. The new

Using Sheetlock No. 11 (90° angle-double channel) on rigid asbestos board.

Use your own drive cleat on Sheetlock "U" Strip.

The "Notch" (on all Sheetlock) grips and holds the board.

Fabricate Ducts with Self-Locking SHEETLOCK Strip!

Obtain Sheetlock from your jobber—No priority. Sheetlock Strips come in different sizes and shapes for specific purposes and uses.

Sheetlock, the self-fastening metal strip, is designed for DUCT fabrication, by sheet metal tradesmen, using any type sheet board on the market today.

Sheetlock saves time and labor and is easy to work—simply push the board into the Sheetlock channel, and specially designed notches hold it firmly and securely. No nails, screws, or bolts required. A new "U" strip has just been added to the Sheetlock line. It enables the joining of two rectangular ducts quickly and securely by means of a drive cleat. (See photo.) Sheetlock is also used in manufacturing cabinets, shower stalls, lockers, etc. Solve your fabricating problems by using Sheetlock on all non-metallic sheets.

Write for samples and literature today

SHEETLOCK COMPANY, Tel. Longbeach 5122

4521 N. Clark St. Chicago, Ill.

New Products . . . . . .

For your convenience in obtaining information regarding these items, use the coupon on page 76

compound displaces the slick, oily surface typical of galvanized metal with a roughened, "toothy" surface to form a tight bond with the paint. It also neutralizes the alkalinity and passivates the metal instantly, forming an inactive film which will not become alkaline and which is resistant to corrosion.

Turco Redi-Paint can be applied by hand or by tank immersion. When applied by hand, The Redi-Paint is wiped on full strength or diluted with water, with a sponge or rag.

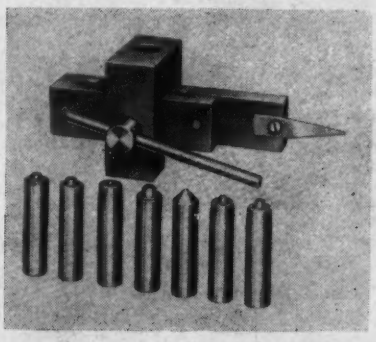
◆

• 48—Flaremaster Tool

Everhot Products Co., 2055 W. Carroll Ave., Chicago 12, announces the Flaremaster flaring tool designed to produce a double strength flare with speed and precision, on any ferrous or non-ferrous tubing in sizes from ⅛ to ⅝ in. OD.

The tool consists of holding jaws, a "U" shaped clamp with a built-in vise. Wearing parts and punches are of hardened steel. Jaws are counterbored to provide exact length of tubing.

More than a year ago, the company brought out BundYfleX soft steel copper coated tubing (copper fused and copper coated both inside and outside) to take the place of copper and aluminum tubing. With the new

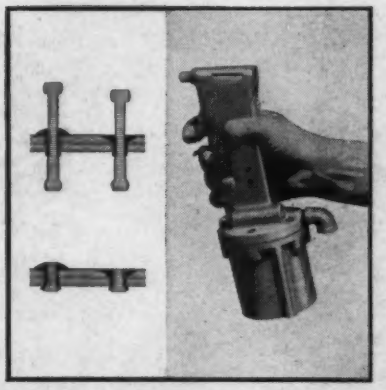


Flaremaster flaring tool, it is now possible to employ BundYfleX soft steel tubing on more applications to further conserve copper and aluminum.

◆

△49—Power Gun

Cherry Rivet Co., 231 Winston St., Los Angeles, California, has designed the G15 gun for high speed application of Cherry blind rivets in double

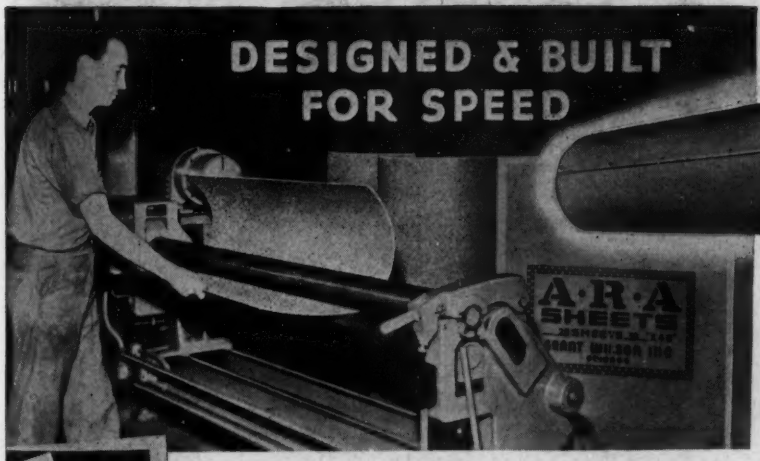


surfaced structures where access to one side of the work is obstructed.

The G15 is an all-pneumatic gun. The design has been simplified to make fewer parts in the power linkage. General refinements have been incorporated to make a smooth acting, better balanced tool. Cast aluminum, steel and bronze are used in its construction, giving a good balance of strength against weight. Hose connections are standard for ¼ inch lines. Overall height is 10⅝ inches with maximum diameter of 3⅞ inch. The gun weighs approximately 4½ lbs. Operates on 75 to 100 lbs. PSI pressure.

Three interchangeable pulling heads handle the three standard diameters of Cherry rivets—1/8, 5/32 and 3/16, either hollow or self-plugging types. Clearance around the rivet axis is ⅜ inch.

A·R·A SHEETS are Workable!



You can roll up A.R.A. Sheets satisfactorily and quickly on your own rollers into strong smooth round pipe. All you have to do is feed the sheets thru the same as you would a sheet of steel.

You can roll the back of fittings to make bends or you can roll round pipe. Standard metal (sheetlock No. 2 seams) can be used, or you can rivet, screw or staple longitudinal lap-joints in your shop or on the job. You can roll a piece of A.R.A. Sheet or a narrow strip of scrap metal to form either sleeve or collar for the butt joints. Try A.R.A. Sheets and be convinced.

Write today for the free 16-page illustrated booklet No. 89A, which describes the many outstanding features that are possible only in A.R.A. Sheets. Get genuine A.R.A. Sheets from your jobber.

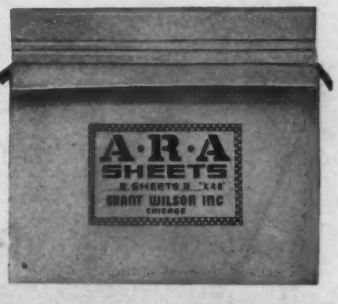
Asbestos clad A.R.A. Sheets are tough yet flexible—rigid but not brittle—fire-proofed and water-proofed—will not dry out, crack, crumble, or chip, have a high insulating value (K. 45' B.T.U.) and good sound-deadening properties.
Here is the package of A.R.A. Sheets that make it the most convenient sheet to ship, stock or carry on the job. The Sheets are always clean and in good condition.

CARTON CONTENTS

20 Sheets 33" x 48" Per Carton
40 Sheets 16½" x 48" Per Carton

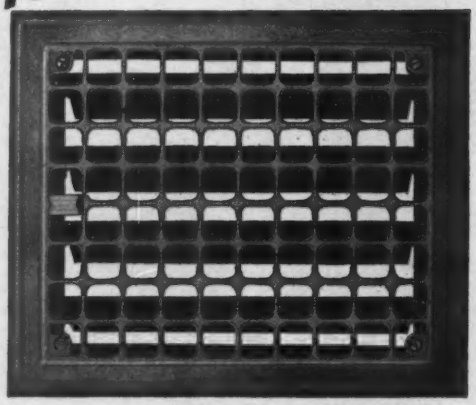
SHIPPING WEIGHT
Approximately
100 lbs. Per Carton

SHEET THICKNESS
Approximately
3/16" thick



4101 WEST TAYLOR ST. **GRANT WILSON, INC.** CHICAGO ILLINOIS

PROMPT SHIPMENT of CLASS 200 STEEL FLOOR REGISTERS



IN ALL OF THE FOLLOWING STANDARD SIZES:

8x10, 8x12, 9x12, 10x12, 12x14

Black Japan and Oak Finishes

With the patriotic approval of the great majority of our customers, floor registers are being made in the long popular Class 200 to save material and manpower. Neatly formed fretwork affords large free area; beautifully finished. You can order the standard sizes listed above with assurance of prompt shipment.

Baseboard and Sidewall Registers Also Available

Both No. 120 and No. 130 Series Baseboard Registers are available from stock, in all sizes, in the popular Metalustre finish. Sidewall Registers in stock for immediate shipment are No. 330 Fin Type Register, sizes 10 x 8 and 12 x 8, and Class 345 Reversible Register which has replaced Class 340 and Class 350 for the duration.

For details see current catalog of the complete line—No. 42.

H&C

HART & COOLEY MANUFACTURING CO.

World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

Check — House Insulation

(*Continued from page* 47)

temperature difference when insulation and storm sash are supplied to the first, second and third stories. These savings are given in actual Btu per hour and also in percentages of a 100 per cent heat loss for the uninsulated, un-storm-sashed building.

Fig. 3 shows that for the structure as a whole the application of insulation in the ceiling and walls and the use of storm cash and storm doors reduce the overall total heat loss from 150,000 Btu per hour to 51,000 Btu or a saving of 0.34 per cent.

In connection with fuel oil conservation measures, this use of insulation and storm cash should be emphasized continuously. The fuel conservation measure was based upon an assumed reduction of 33⅓ per cent in the amount of oil ordinarily consumed. If the house was insulated and storm sash applied, the owner could enjoy about the same indoor condition at the 33⅓ per cent oil reduction. Unfortunately, in most oil-heated homes, the owner applied insulation and storm cash when he decided to use oil, so this 33⅓ per cent reduction in heat loss can not be obtained by insulation. The result is that the home owner, who started with a good, efficient system and a well insulated house is having to accept lower inside temperatures and to do all manner of heat saving measures in order to be warm.

H&C DAMPER REGULATOR SETS

ECONOMY TYPE. Three ways to install: 1. With lock nut but without handle (for tamper-proof setting). 2. With handle and lock nut. 3. With handle and wing nut. Nut prevents damper vibration. Handle always indicates position of damper (Patent 2,146,142). Furnished with handy snap end bearing. Complete set in carton. Made only with ¼" bearings.

LIST PRICE.....No. 40¼S....$0.30

BRACKET TYPE. Nut holds damper securely, preventing vibration. Handle which indicates position of damper, may be left in place permanently or removed after adjustment (to prevent tampering). Snap End Bearing on ¼" size, Solid Bearing on ⅜" size. Each set individually packaged.

LIST PRICES.....No. 50¼.....$0.40
No. 50⅜ $0.60

DISK TYPE. Like all H&C sets, this set is equally adaptable to splitter or regular dampers. Snap End Bearing on ¼" size, Solid Bearing on ⅜" size. All parts are rust proofed. Complete set in carton.

LIST PRICES.....No. 80¼.....$0.40
No. 80⅜ $0.60

See your jobber or write for literature and sample.

HART & COOLEY MANUFACTURING CO.

HOLLAND, MICH. · PHILADELPHIA OFFICE: 1600 ARCH ST.

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 76.

259—Welding Positioners

Ransome Machinery Company, Dunellen, N. J., offers a new bulletin, No. 196, illustrating and describing the 2,500-lb. capacity hand-operated welding positioner.

◆

260—Amco Galvanizing Compound

American Solder & Flux Co., 2152 E. Norris St., Philadelphia, is distributing Bulletin No. 52, a 4-page folder covering Amco Galvanizing Compound (Brand E), for repair and maintenance of any galvanized part in service, or the repair of major galvanized equipment damaged during fabrication and assembly. Amco Galvanizing Compound meets Army and Navy specifications.

◆

261—Squirrel Cage Induction Polyphase Motors

Century Electric Company, 1806 Pine St., St. Louis, Missouri, is distributing a 16-page catalog covering Century Squirrel Cage Induction Polyphase motors—construction, sleeve bearings, ball bearings, splash-proof, totally enclosed fan cooled, explosion-proof, standard designs, horizontal and vertical designs, horizontal and flange designs, all-steel construction, fractional horsepower and larger sizes. Two pages are devoted to how to select motors.

◆

262—Lindsay Structure Assembly

Lindsay and Lindsay, 222 W. Adams St., Chicago, has released a new eight-page booklet entitled, "An Introduction to Lindsay Structure."

Lindsay Structure is a light-steel, pre-fabricated construction possessing a high strength-weight ratio. It can be used for machine housings, refrigerator buildings, industrial buildings, truck bodies, ovens, processing rooms, unit coolers, and other structures.

This new booklet gives complete details, in both words and pictures, of the simple step-by-step procedure of assembling Lindsay Structure. It also contains case histories on applications of the Structure in the industrial, automotive, and marine fields. Copies will be sent upon request.

◆

263—Industrial Dryers & Drying Systems

B. F. Sturtevant Co., Hyde Park, Boston, has just issued a new catalog—No. 461—devoted to drying systems and apparatus. In addition to features of their own equipment, this catalog contains data of general interest to those engaged in production work involving drying at some stage in the manufacture of the finished products.

Among the topics included is an exposition of fundamental drying principles, a description of various types of drying processes and the apparatus used to effect them, and also a description of the design of systems used in certain specialized drying applications—all well illustrated by numerous installation photographs and by schematic diagrams showing the layout of certain types of drying systems.

◆

264—Electro Zinc Plated Steel Sheet

American Nickeloid Company, Peru, Illinois, is distributing a folder containing factual information on zinc-plated steel sheet, introduced several months ago.

Zinc coating will not rust and resists corrosion. When electro-plated to a steel base, a galvanic action takes place between the zinc coating and the basic steel which imparts additional corrosion resistance to the steel.

Sizes up to 36 x 96 in.; gauges .008 to .062 in. and heavier in a full range of tempers; polished, unpolished or satin on one or both sides.

Zinc plated steel can be bent, stamped, formed, drawn, soldered, and spot-welded to meet most production requirements. Plating thickness can be varied to meet specific requirements.

VERSON
ALLSTEEL PRESS CO.
93rd and Kenwood Avenue
Chicago 19, Illinois

TRADE Verson MARK
JUNIOR
PRESS BRAKES

Fast, powerful Verson Junior Brakes are built to give big machine performance with small machine economy. The coming peacetime competition will require all the advantages you can get — a Verson Press Brake will give you many of them.

WAGNER PRODUCTS SPEED VICTORY!

THOROUGH INSULATION

IS ONLY ONE OF THE MANY REASONS WHY

Wagner MOTORS STAY ON THE JOB!

All Wagner motors are built to exacting specifications, and embody characteristics and features that give them long life, dependability and added protection against failure. Wagner engineers will not compromise on "good enough" insulation—all windings must be thoroughly insulated. This is only one of the many reasons why Wagner motors stay on the job.

The illustration on this page shows a typical polyphase stator winding. The stator cores of these motors are well insulated, using special slot cells formed from tough fibrous material, cuffed on each end for extra strength. The coils are shaped to fit snugly in the slots so that there is no possibility of vibration and at the same time the windings are easily put into place. Heavy separators are used between the coils in the slot, and inverted U-shaped cells fit over the tops of the coils under the slot wedges. The free ends of the windings are completely taped well into the slot cells, and heavy sheets of black varnished muslin are slipped between the coils of the various phases to insulate them from each other.

After the windings are in place, the stator is baked to remove all moisture, and while still hot it is immersed in a heavy insulating varnish. When the heated stator core is immersed in the much cooler varnish, a suction is created which produces complete impregnation of the windings. The stator is immersed long enough so that the insulating varnish impregnates the innermost portions of the coils. The stator is then baked again until this coating is completely dried. It is then given another dipping and baking to insure complete impregnation and to provide an added moisture-resisting coating. Finally, the stator is sprayed with air-drying varnish, which not only provides further resistance to oil and moisture, but also gives the coils a glossy surface.

Write for Complete Information

Complete information on Wagner motors will be sent upon request. Wagner is a nation-wide organization with branches in 29 principal cities. Each branch office is manned by trained field engineers ready to help you solve your motor-drive problems.

M43-13A

Wagner Electric Corporation
ESTABLISHED 1891
6371 Plymouth Avenue, St. Louis, 14, Mo., U.S.A.
ELECTRICAL AND AUTOMOTIVE PRODUCTS

New Literature . . . .

For your convenience in obtaining copies of New Literature use the coupon on this page.

265—Black Finishes

Alrose Chemical Company, Providence, Rhode Island, is distributing a folder describing Oxidines—black finishes for brass and copper, zinc, and cast iron; also the Jetal process for iron and steel.

◆

266—Ucilon Protective Coating

United Chromium, Incorporated, 51 East 42nd St., New York City, has prepared a 12-page bulletin summarizing the unusual properties of Ucilon—a new surface coating formulated with new and improved synthetic resins. Ucilon produces a tough, flexible coating that is resistant to organic and inorganic acids, alkalies, salts, alcohol, gasoline, oils, greases and moisture. It has excellent dielectric strength and can be readily applied to wood, metal, or concrete, by brushing, spraying or dipping.

◆

267—The Case of the Careless Kitchen

Ilg Electric Ventilating Co., 2850 N. Crawford Avenue, Chicago, Illinois, is distributing a 32-page book—pocket size—entitled "The Case of the Careless Kitchen and Other Crimes," by a private investigator—illustrated by Henry Brennan. This is followed by other brief stories—"The Case of the Sleepless Knight," "The Case of the Apathetic Gang" and "The Case of the Antiquated Club."

Ilg hopes you will get a chuckle out of this satirical treatment of realistic, age-old problems.

◆

268—Sheet Metal Mathematics

Mathematics for the Sheet Metal Worker, has been prepared by Clayton E. Buell, instructor of Related Trade Mathematics, Science and Drawing, Apprentice School, U. S. Navy Yard, Philadelphia, and Edward Bok Vocational School, Philadelphia.

These are the mathematics essential to general, aircraft, shipbuilding and other sheet metal shop workers—a practical, applied mathematics book for worker and trainee in all shops where sheet metal is worked. For "on the job" training, vocational school classes, apprentice school classes, adult classes, male and female helper trainee schools, evening schools, trade schools, technical schools, home study.

All problems arise from real jobs or blueprints. The author's varied experience has enabled him to couple classroom teaching techniques with the practical viewpoint of actual shop conditions. He has taught related trade mathematics to sheet metal apprentices in the U. S. Navy Yard and Naval Aircraft Factory; to sudents in vocational, evening and other schools.

Pitman Publishing Corporation, 2 West 45th St., New York City. Price, $2.00.

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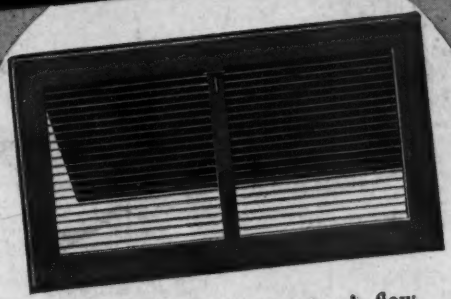

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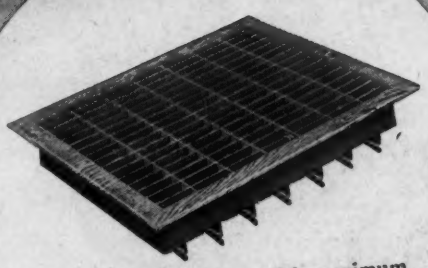

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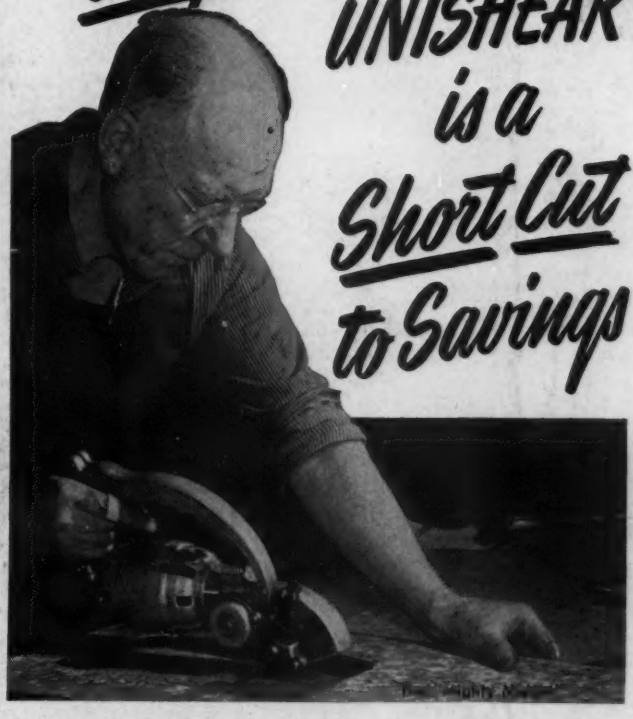

SAVE WORK The Stanley "Mighty Midget" and No. 16A portable Unishears are perfectly balanced, easier to handle than snips. Both men and women can cut more metal per day with less fatigue.

SAVE TIME Stanley Unishears cut *fast* – up to 15 feet per minute. Follow any line, cut any shape with hair-line accuracy – straight cuts, curves, angles, small radii. Just plug in wherever the job is – saves moving the work about the shop.

SAVE METAL Unishears leave smooth edges that require no further finishing. There's no distortion of the metal – no waste.

Unishears are helping many war plants make short cuts to new speed records on sheet metal fabrication. Portable models handle up to 12 gauge hot rolled steel – stationary models up to 10 gauge. Stanley Electric Tool Div., The Stanley Works, 131 Elm St., New Britain, Conn.

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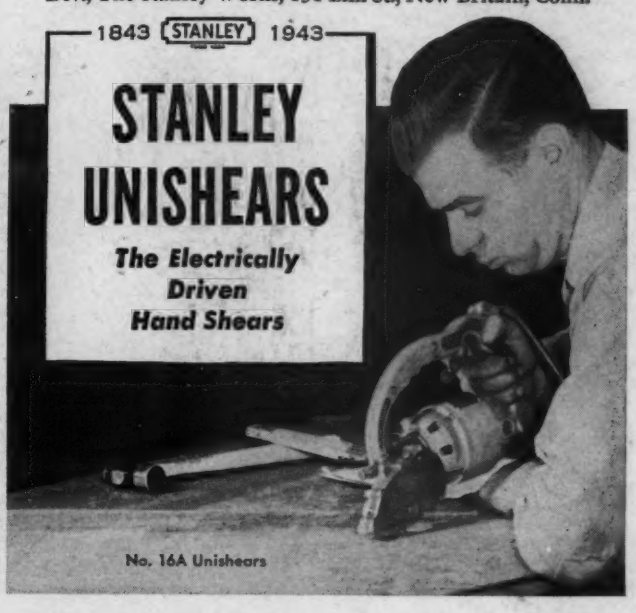
The Electrically Driven Hand Shears



No. 16A Unishears

Association Activities . . .

Rochester, New York

A recent survey made by the officers of the Master Sheet Metal, Furnace and Roofers' Association, of Rochester, New York, on the labor situation in the shops of both members and non-members who do business locally has brought to light an alarming need for men to do heating and sheet metal work.

All shops are now operating with less than half of their usual number of employees, and approximately 30 per cent of the smaller shops have discontinued operations entirely.

The U. S. Employment Service is unable to furnish us with mechanics and the trade schools—our usual source of supply for helpers and apprentices—cannot meet our needs because of the draft. This places the burden on the shops still operating and they will be unable to meet the needs of the community for essential heating and sheet metal work unless they can keep their present employees.

We suggest that all contractors engaged in rendering these services which are listed as practical occupations in "Repair and Hand Trade Service Bulletin No. 42," request deferment for employees who are skilled in the performance of these services, so that we may continue to carry on this essential work, which is so necessary to insure the health and safety of our civilian population, many of whom are engaged in War Industry.

Richard W. Friday, Secretary.

Milwaukee

Milwaukee Sheet Metal Contractors Association, Inc., members were requested to write Senators LaFollette and Wiley to support Bill S. 883 which will create the office of "Assistant Secretary of Commerce for Small Business" which will be the co-ordinator of bureaus and agencies and a clearing house for information affecting business-government contacts, and the headquarters to which business men may turn for help and information.

Angelo Hoffmann analyzed and discussed with members the working of the "Manning Plan" which was interesting for those present at the July 6 meeting.

Director Marth discoursed on the conversion plans under which the operators have to work through HOLC and cited his experiences regarding the voluminous reports on forms furnished.

The matter of a national association was presented and the unanimous vote of the members approved and supported the movement of a national association. A delegate will attend the next meeting.

Ethical advertising was also discussed.

Paul L. Biersach, Secretary.

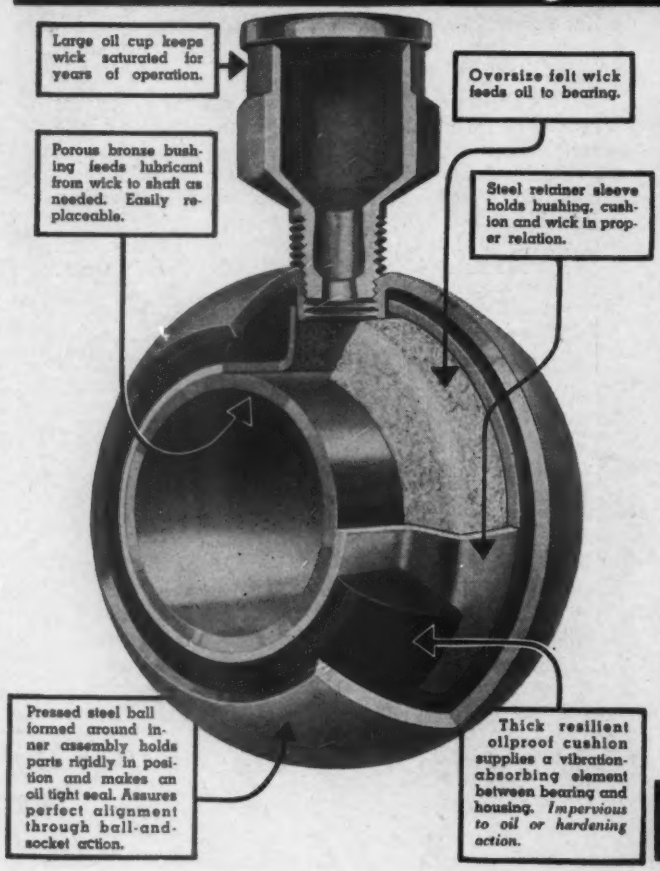
◆

Florida

The Florida Roofer begins its fourth year as the official publication of The Roofing and Sheet Metal Contractors' Association of Florida, and the purpose of this publication will have been accomplished if the association can be held together during the war period and be ready to function more actively after that time.

The Controlled Materials Plan is discussed and a letter from the War Production Board is quoted, telling the necessary procedure to get steel, nails and other material.

No Other Bearing In Air Conditioning has all these QUALITY FEATURES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In designing your after-the-war fans, blowers, and other devices requiring silent operation, perfect alignment and self-lubrication—include the Triangle Shock-Absorbing Pillow Block.

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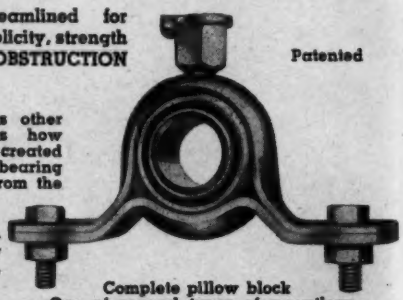
Cut-away view shows other features and illustrates how unique engineering has created a new type of silent bearing outstandingly different from the conventional.

Triangle design assures high efficiency and low cost operation.

Write for quotations.



Complete pillow block
One of several types of mountings

TRIANGLE MANUFACTURING CO.
392 DIVISION STREET OSHKOSH, WISCONSIN

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SKILSAW TOOLS BOOST PRODUCTION at LINDBERG ENGINEERING CO.

SKILSAW PORTABLE GRINDERS—Speed up all grinding, wire brushing, buffing and polishing on metal surfaces . . . remove rust scale.
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● Ask over at Lindberg Engineering Company . . . and you'll hear plenty about the speed of SKILSAW TOOLS in turning out essential heat-treating equipment. Look around the Lindberg plants that fly the Army-Navy "E" . . . and you'll see plenty of SKILSAW TOOLS in action . . . speeding up countless drilling, sawing and surfacing operations!

Here's the reason! SKILSAW TOOLS are lighter, more compact, more powerful. They're *preferred* by workers and management alike because they *handle easier* . . . do more jobs *better* . . . and stand up *longer* under today's toughest conditions. Ask your distributor to prove it with a demonstration of SKILSAW TOOLS on your own work *today!*

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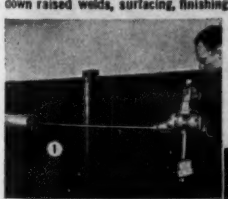
SKILSAW DISC SANDERS—For faster sanding on flat or curved surfaces of wood, metals, compositions. For grinding down raised welds, surfacing, finishing.



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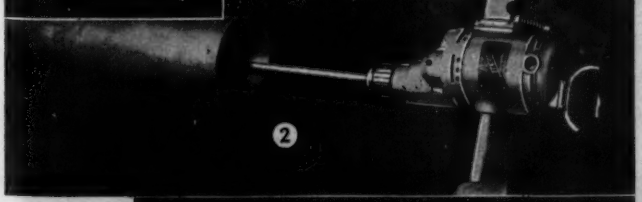

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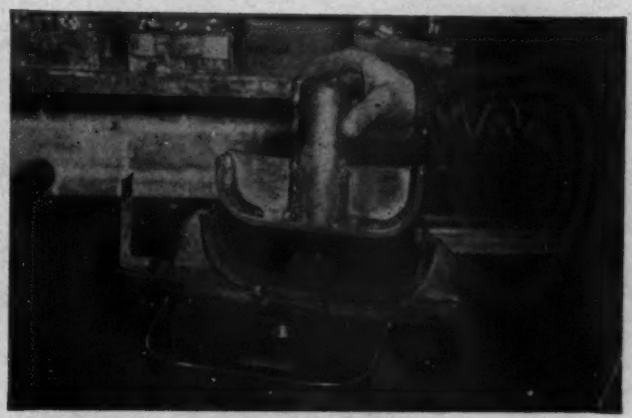
★ MAKE AMERICA'S HANDS MORE PRODUCTIVE ★

DON'T MISS JOBS LIKE THESE!

LEARN from the war jobs how to earn more income in the post-war era. Learn while you earn with arc welding! Do better work at lower cost on jobs like these:

TOOL BOXES. For special army trucks. Made of ⅛" plate, fabricated with "Fleetweld 5". Angle framework. Courtesy Smith Machine & Welding Shop, Bowling Green, O.



DIES. Cut forming costs of parts like strap in foreground by building your own die by Lincoln arc welding. This one made from flat bar, plate and round bar by Frederick Machine Works, Norwalk, O.

IDEA BOOK. "Procedure Handbook". Recognized world over as authentic reference guide on all phases of arc welding. 1308 pages. 1810 illustrations. $1.50 postpaid in U. S. A.

THE LINCOLN ELECTRIC COMPANY

Cleveland, Ohio

Largest Manufacturers of Arc Welding Equipment in the World

Association Activities . . .

(*Continued from page* 78)

The National Pressed Steel Roofing Co., of Jacksonville, has been added to the list of Associate members.

Membership is important and activities of the association can be increased as more funds become available. Annual dues for 1943—$5—and news items are invited.

L. A. Burgess, Secretary-Treasurer.

◆

Wisconsin

The Sheet Metal Contractors Association of Wisconsin, Inc., has received the following letter from R. F. Segur, Tin-Lead Division, War Production Board, Washington, D. C., in reply to their inquiry setting forth their difficulties in using 20-80 solder, making it bond and hold, trouble with the soldering coppers, etc.:

"We acknowledge receipt of your letter of June 7 regarding the use of 20 per cent tin solder for sheet metal work.

"This solder was adopted after considerable discussion with manufacturers, users and the Armed Services. New specifications have been issued by the Army and Navy for general purpose solders. These specifications provided for 20 per cent tin, ½ silver and between 1-2 per cent antimony. Specifications similar to these have been adopted by leading manufacturers and they are furnishing substantial quantities of solder conforming to them. On the basis of the tests available to us, these solders have greater tensil strength, and at least equal bonding strength, as compared with high tin content solders.

"It is recognized that more heat is required to use them, but most users seem to have been able to solve this problem by the use of heavier soldering irons or by the use of torches instead of irons."

The May 8 Board of Directors and District Meeting of the Sheet Metal Contractors Association of Wisconsin, Inc., was held at Hirwig's Club House on Lake Mendota. Members from Racine, Monroe, Milwaukee, Fond du Lac, and Madison were on hand when President Paul Krueger called the meeting to order.

The Sales Exchange Bulletin inaugurated was discussed and members were invited to avail themselves of the opportunity provided and to co-operate.

Attorney Frances Lamb, executive secretary of the Madison Construction Association discoursed on present and future conditions in the construction industry.

After adjournment, a superb lunch and refreshments were served and the Madison Local was thanked for their hospitality.

Paul L. Biersach, Secretary.

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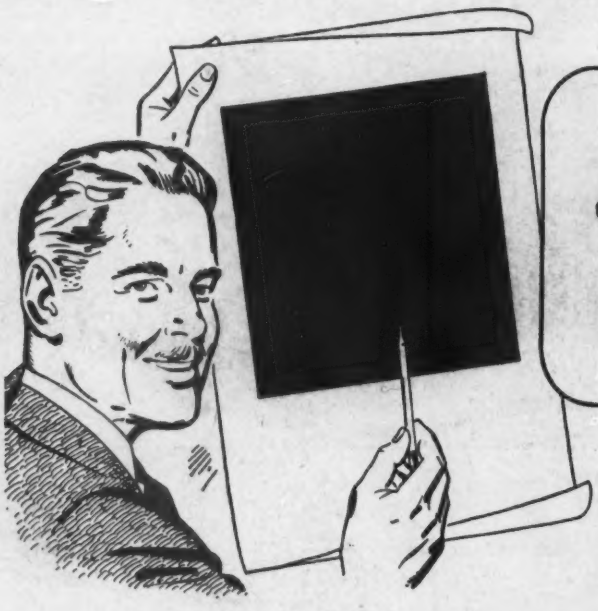
Julius S. Vogt

Julius S. Vogt, 56, formerly owner of the Standard Sheet Metal Co., 4220 West Lake Street, Chicago, passed away on July 1. His home was at 1230 Rossell Avenue, Oak Park. He is survived by his widow and two sons.

Mr. Vogt was president of the Ventilating and Air Conditioning Contractors Association from November 15, 1938, through the years 1939 and 1940.—L. W. Rogers, Sec'y.



Interior view

OF A

PAYNE PRODUCT, 1943

It might be a dark-room for Army photographers, a part for a fighting plane or some other accessory or weapon for the armed forces. If the "blackout" leaves you curious, remember that Hitler and Hirohito would be interested, too! ★ PAYNE'S greatly-expanded facilities are now devoted exclusively to war production. And we're all proud of the identification badges we wear; thankful for our important tasks on America's great industrial front, so essential to final Victory.

LOOKING AHEAD—V-Day will find us better-equipped than ever to provide PAYNE Dealers with furnaces engineered for leadership; precision-built of finest materials; tested in our own modern laboratories; and *designed to make friends.*

PAYNEHEAT

Payne FURNACE & SUPPLY CO., INC., BEVERLY HILLS, CALIFORNIA

Power Heaters

FROM 300,000 to 2,800,000 B.T.U'S PER UNIT
—TODAY THEY'RE WORKING FOR UNCLE SAM
• TOMORROW THEY'LL MEAN PROFITS FOR YOU

Bertossa Power Heaters are today working overtime heating army camps, navy bases, hospitals, utility buildings, etc., for United Nations forces all over the world. And here at home they are being specified by heating engineers and architects for homes, churches and industrial buildings.

This popularity is due to (1) compactness of complete blower and heating unit; (2) down draft flue for increased efficiency; (3) 90% direct heating surface and (4) adaptability for complete air conditioning.

From every standpoint the Bertossa has proven its effectiveness on the job—and likewise its profit opportunities to live-wire dealers.

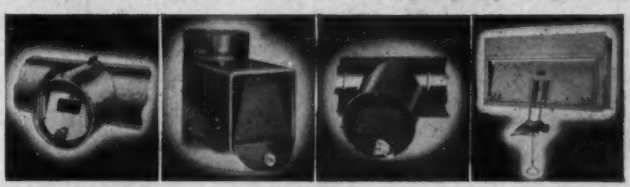
Bertossa

JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN

. . . Against
OLD MAN WINTER

The success of Uncle Sam's *fuel conservation program* depends on YOU. Uncle Sam is telling them WHY — you must show them HOW — to conserve fuel with specific products. Write or wire now for full data on the Field line of Barometric Draft Controls for domestic and commercial installations. Act now.

FIELD DRAFT CONTROLS
SAVE 5% TO 25% OF FUEL



By controlling natural draft, the Field Control cuts fuel consumption 5% to 25%! The units shown cover installations ranging from space heaters to large industrial boilers — coal or oil. The domestic units require as little as 30 minutes to install. The market is enormous.

FIELD CONTROL DIVISION
H. D. Conkey & Co.
Mendota, Illinois

Association Activities . . .

Chicago Alliance Told—Use Metal in Straight Pipe

AIR Conditioning Contractors' Alliance second open meeting, held June 24, presented for consideration by contractors and guests two subjects of vital interest to the warm air heating industry.

The first presentation was made by FHA covering the problem of using materials in inventory on new house installations. A. C. Zirwas of FHA said that Chicago FHA office has received a letter from Washington stating that prefabricated metal duct (not flat sheets) from inventory may be used on straight runs of pipe, providing that these materials were purchased prior to May 1, 1943. If you bought flat sheets, you must have fabricated the sheets into pipe before May 1 in order to qualify.

There are other complications to this situation also. The general contractor for whom the installation is made must send four copies of a letter on his letterhead to FHA asking FHA for permission to use the additional poundage of material required for the straight pipe. The general contractor must declare in this statement that you as the heating contractor *or your supplier* had these materials in inventory prior to May 1, 1943. The general contractor must also state in this letter that you as the heating contractor will not attempt to replenish these materials used from inventory by extending to your supplier the project rating which the general contractor has been given.

Under this new interpretation, it is possible for a heating contractor on new house work to use prefabricated metal pipe or tin or galvanized iron or black iron in Chicago on both fittings and straight runs of pipe where previously metal was prohibited in straight runs of pipe and permitted only in fittings or concealed ducts. But if the contractor uses this material, he has no way of replenishing his stock unless he finds some supplier willing to sell him material without priority.

A jobber can sell such materials to the contractor if he wishes to do so, but the jobber is not permitted to replenish his stock by applying for replacement material on his next PD-IX application. This whole proposition, therefore, boils down to permission to use metal in straight runs of pipe in Chicago if you had metal pipe fabricated prior to May 1, or if you do not expect to replenish your inventory or if you can buy from a jobber who is willing to sell without replenishing inventory.

The second part of Mr. Zirwas' discussion centered around the matter of what substitute materials are approved by the Chicago FHA office. FHA does not permit publication of these accepted materials so the contractor must continue to ask FHA whether or not the material he proposes to use is acceptable. It can be said, however, that in general on supply lines, up to the plenum most of the cement-asbestos boards can be used and so can most of the prefabricated "substitute" ducts. For supply lines up to six feet from the furnace, most of the popular materials can be used.

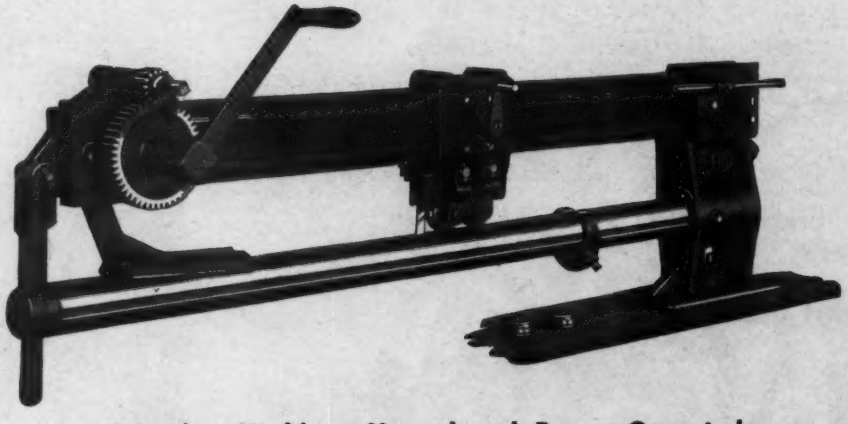
A. J. Birk of WPB discussed the controlled Materials Plan, particularly the CMP Regulation 5, which pertains to materials for maintenance and repair. We will not discuss this address because in this issue we are publishing a complete discussion of how to get materials for maintenance and repair under CMP.

FLEXIBILITY

DESIGNED for Speed, Accuracy and Long Life. Grooving Machines are representative of a complete line of Machinery for Sheet-Metal Fabrication.

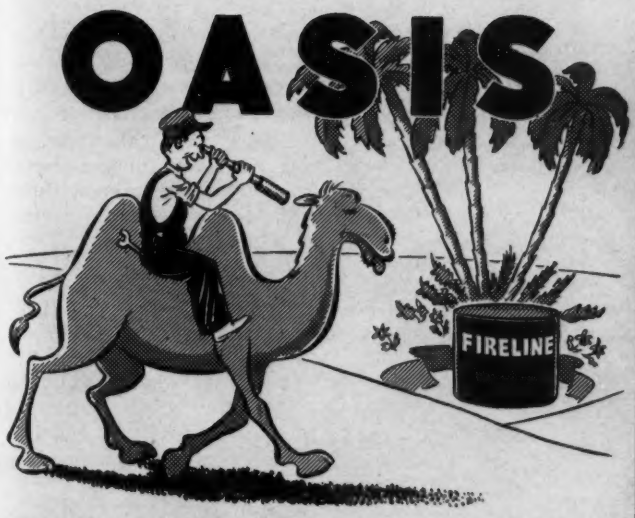
Look for the PEXTO trademark.

PEXTO



Grooving Machines—Manual and Power Operated

THE PECK, STOW & WILCOX COMPANY Since 1785 SOUTHINGTON, CONNECTICUT, U. S. A.



for furnace men

You're not dreaming: There IS one product you can still get! You're jobber has Fireline Stove & Furnace Lining in stock—and he doesn't ask for priorities or permits.

Fireline takes you out of today's mess of trying to get firepot castings—gives you an ideal means of repairing cracked and burned-out firepots. But that isn't all: You can also sell it to protect and preserve good castings. In other words, *every furnace owner* is a prospect for a Fireline job.

A simple statement of the proved qualities of Fireline "sells" the job. Simply explain to the furnace owner how Fireline seals the holes and cracks—how it provides a remarkably durable lining which heats up from edge to edge and assures a bright fire that cuts fuel cost—how it costs less than a new firepot.

And don't forget this: While the price to the owner is *lower, your* profit, in relation to the material and labor involved, is *greater.* That's because you can do the job with Fireline in a fraction of the time required to dismantle a furnace and put in new firepot castings. Write for bulletins, prices, and name of nearest jobber.

- *Salvages burned-out firepots.*
- *Protects good castings.*
- *Saves fuel for owner.*
- *Saves metal for war production.*

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury St., (Dept. G), Chicago, Ill.

FIRELINE
STOVE & FURNACE LINING

Comfort in STEEL "IGLOOS"

IN Iceland, Alaska, Australia, in new swiftly built "Igloos," Americans far from home welcome the cheery glow and comfort of American-built Oil Burning Heaters. Cold that numbs to the marrow gives way quickly to the steady flow of heat that responds to the quick twist of the dial on A-P DEPENDABLE Control Valves serving these heaters.

Building accurate and dependable fuel control mechanisms for these compact, highly efficient barrack heaters is one of A-P's wartime privileges . . . A privilege based on long experience serving the heating comfort of millions of American Families.

New accuracies, new fuel economy, new heating efficiency developed in these wartime heating control units will be yours to use — important sales features — in post-war heaters.

Post-war Planners in heating know this . . . Are coming to A-P Research Engineers for aid in new developments that will make rich new markets for Oil Burning Appliances after the war. Watch for these developments — and the A-P Dependable Controls that help them to success.

AUTOMATIC PRODUCTS COMPANY
2452 NORTH THIRTY-SECOND STREET
MILWAUKEE WISCONSIN

Oil Control Valves
DEPENDABLE...
in **WAR** *as in* Peace

With the Manufacturers . . .

Sharp Heating Supply Company

Harold S. Sharp announced the formation of the Sharp Heating Supply Company to distribute Williamson furnaces, pipe, fittings, registers and a complete line of repairs for all makes of furnaces. The company will specialize in serving the furnace dealers in the Cleveland area.

H. S. Sharp

Sharp Heating Supply Company has acquired and will operate a large warehouse at 7802 Wade Park Ave., Cleveland—Phone Express 3638. Ample parking space is available for the dealers. Instant service will be the keynote and a complete line of heating supplies for the repair and maintenance of home heating equipment will be available.

Harold Sharp formerly was vice president and sales manager of The Henry Furnace & Foundry Company. He also is president of the National Warm Air Heating and Air Conditioning Association.

With Mr. Sharp in this venture will be associated Jesse F. Rushton and Harry R. Siegenthaler of Cleveland.

"Jes" Rushton has been in the furnace business for more than 20 years servicing dealers.

Harry Siegenthaler has been in the office end of the furnace business for 19 years.

A newspaper advertising program designed to assist the furnace dealers to secure repair and maintenance work will appear in the *Plain Dealer*.

"The full cooperation of The Williamson Heater Company has been assured" says Mr. Sharp, "which means a continuous educational program in old house work which is so essential at this time."

◆

McCormack Joins Fox Munitions

Denis McCormack, for the past 11 years manager of commercial instruments and controls and of the flight instruments department of **Julien P. Friez & Sons**, Division of Bendix Aviation Corporation, Baltimore, joined **Fox Munitions Corporation**, 21st and Arch Streets, Philadelphia, on July 1 as general manager.

Mr. McCormack succeeds the founder, Ansley H. Fox, who is retiring. Fox Munitions Corporation manufactures thread and other gauges, tools and instruments of precision, and is playing an important role in certain phases of the ordnance program.

◆

Obituaries

Otto J. Kuenhold, 62, Engineer, **Monmouth Products Company**, Cleveland, collapsed at his desk on Thursday, July 1, and died the following day from a cerebral hemorrhage at Polyclinic Hospital. Mr. Kuenhold had been associated with Monmouth for the past eight years. He was the founder and president of the Scientific Heater Co., manufacturers of garage heaters, furnaces and clothes driers, and held a number of patents in the heating field. He is survived by his wife and three sons.

Mr. Kuenhold was the author of a number of articles which have appeared in American Artisan.

◆

Earle D. Parker, 63, vice-president and general manager of **Barber-Colman Company**, Rockford, Illinois, died Saturday, June 12, following a heart attack at his farm near Durand.

Mr. Parker had been with the company for 40 years; for the past twenty years he had been general works manager. He was appointed vice-president following the death of Howard D. Colman in an automobile accident last fall.

★

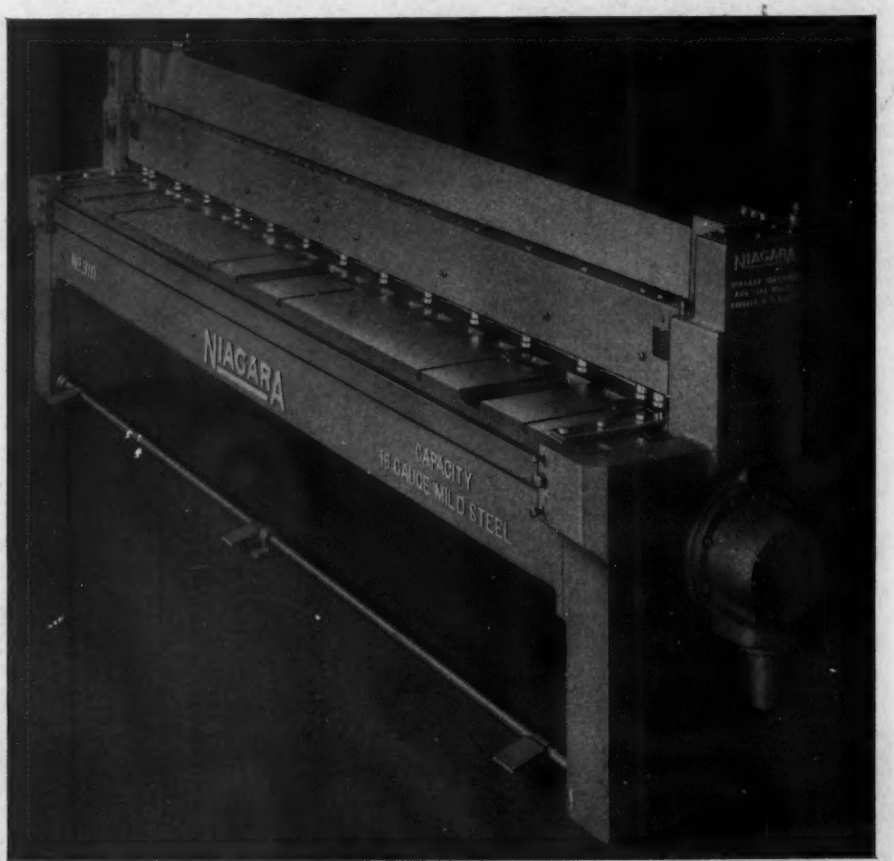
Wherever sheet metal is being sheared or formed, Niagara Power Squaring Shears and other machines are giving more production per hour.

In addition to speeding up production, they are also helping to keep wheels turning and planes flying by doing the many jobs essential to maintenance and repair.

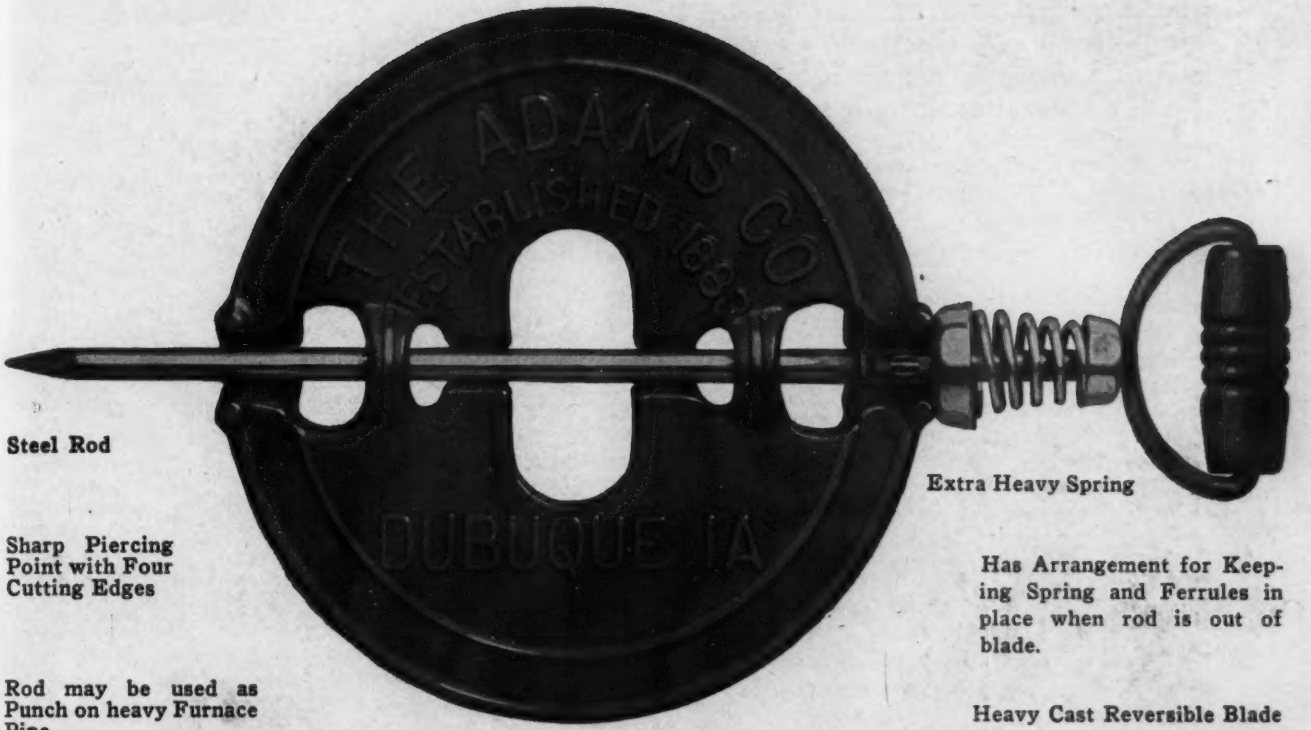
The Series No. 3 Shear illustrated at right is just one of the many modern Niagara machines which are doing important work quicker and better.

• • •

Niagara Machine & Tool Works, Buffalo, N. Y. District Offices: Detroit, Cleveland, New York.



BUY UNITED STATES WAR BONDS



Steel Rod

Sharp Piercing Point with Four Cutting Edges

Rod may be used as Punch on heavy Furnace Pipe

Extra Heavy Spring

Has Arrangement for Keeping Spring and Ferrules in place when rod is out of blade.

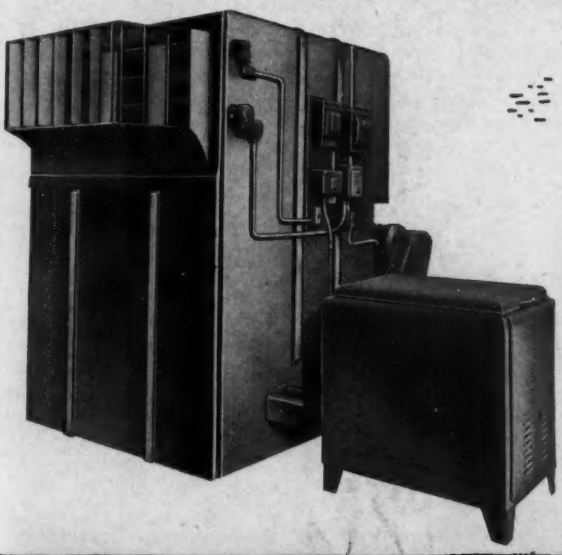
Heavy Cast Reversible Blade

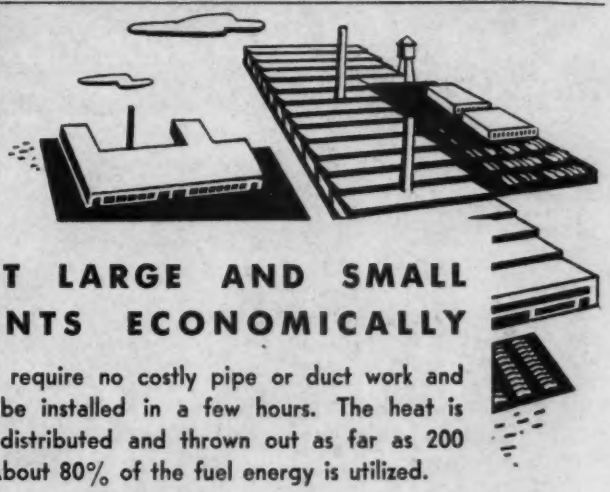
• 1883 — Sixty Years of Service — 1943 •

ADAMS DIAMOND SMOKE PIPE DAMPER

MANUFACTURED BY
THE ADAMS COMPANY
DUBUQUE, IOWA, U. S. A.

DIRECTHERM UNIT HEATERS





HEAT LARGE AND SMALL PLANTS ECONOMICALLY

THEY require no costly pipe or duct work and can be installed in a few hours. The heat is evenly distributed and thrown out as far as 200 feet. About 80% of the fuel energy is utilized.

Directherm Unit Heaters do not require any maintenance. All you need is to set the automatic controls.

For coal, gas, and oil.
Made in 6 sizes (300,000—1,700,000 BTU).

AIRTHERM MANUFACTURING COMPANY

706 S. SPRING AVE. • ST. LOUIS, MO.

★ THE HEALTH AND EFFICIENCY OF THE NATION'S WORKERS ARE IN THE HANDS OF AMERICA'S HEATING MEN SO . . . .

FIX ALL FURNACES NOW!

America's homes must be efficiently heated this winter . . . for the health and comfort of war workers and their families. It is up to *you* to check every furnace in your territory now and be sure that all necessary work is done.

Call on your customers now and call on Northwestern for furnace, stove and boiler repair parts.

Northwestern parts fit perfectly, require the least labor for installation. You get more jobs done in less time. Use Northwestern Parts on all jobs!

NORTHWESTERN STOVE REPAIR CO.

Manufacturers of Stove, Furnace and Boiler Repair Parts

662 W. Roosevelt Road Chicago, Ill.

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

TOGGLE ACTION FOOT PRESSES

Toggle action MULTIPLIES foot power for fast, EASY action on punching and forming operations. Four sizes—7", 10", 18", 24" throat depth. Capacity 2" hole in 16 ga. iron, 100 holes per minute or better.

NO. 17 BENCH PUNCH

Improved model has welded steel frame, lighter weight, new depth and side gauges, and greater throat depth. Capacity ¼" hole in ¼" iron. Highly adaptable and widely used for production line operations.

NO. 5 JR. PUNCH

A handy tool for all sheet metal workers. Capacity ¼" hole in 16 ga. iron. Will punch in center of 3" disc. In metal kit box complete with 7 punches and dies.

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

With the Manufacturers . . .

U. S. Steel Supply Purchases Moise

E. E. Aldous, president, United States Steel Supply Company, a United States Steel Corporation subsidiary, announces the purchase of the physical assets of Moise Steel Company of Milwaukee, Wisconsin.

The Supply company will continue the steel warehouse business conducted formerly by Moise Steel Company in Milwaukee. Carl Gallauer, formerly vice president of Moise Steel Company, has been appointed district manager and J. R. Beers, formerly manager of the Milwaukee sales office, United States Steel Supply Company, has been appointed assistant district manager.

The headquarters offices of the United States Steel Supply Company are located at Chicago. Warehouses are operated in Baltimore, Chicago, Cleveland, Newark, Pittsburgh, St. Louis and St. Paul. These warehouses are suppliers of a widely diversified line of rolled steel products and related items, all of which are vital to the war effort.

United States Steel Supply Company formerly operated a warehouse in Boston, but this was leased for the duration to the United States Navy several months ago.

◆

York Ice Machinery Corporation Changes Name

The York Ice Machinery Corporation, producers of refrigeration and air conditioning equipment, has announced that the company will be known as the York Corporation as a result of final court approval on a plan of merger and recapitalization.

Actually, the 58-year-old company has been referred to generally as the York Corporation for a number of years but now it has been decided to adopt officially this simpler name, S. E. Lauer, president, explained.

The change in name of the York Ice Machinery Corporation resulted from a merger with a subsidiary, the York Corporation. The merger, first proposed in 1941, was upheld in June, 1942, by the U. S. District Court but was subsequently appealed to the U. S. Circuit Court of Appeals by an intervening stockholder. Final decision upholding the merger was handed down on June 15, 1943, by the Circuit Court in Philadelphia. Aside from the change in name and capital structure, the merger affects in no way the company's operations.

◆

Henry Furnace Appoints Sales Manager

James Crombie has been appointed sales manager of **The Henry Furnace Co.** of Medina, Ohio, manufacturers of Moncrief warm air heating, air conditioning equipment, furnace pipe and fittings, according to an announcement by Edward P. Hayes, vice president.

Mr. Crombie for many years has been associated with the warm air heating and air conditioning industry. At the time of his appointment Mr. Crombie was associated with The C. A. Olsen Mfg. Co., of Elyria, Ohio.

Mr. Crombie's previous experience in the heating industry includes many years of contracting and installation of furnaces in Rochester, N. Y., where he was associated with his father, the late James Crombie, Sr.

Other connections of the new sales manager were with the Marshall Furnace Company and with The Fox Furnace Company, formerly a subsidiary of The American Radiator Company.

General headquarters of The Henry Furnace Co. are located at the manufacturing plant in Medina, Ohio.

N.W.A.H.&A.C.

History

(*Continued from page* 69)

authorized to collect and tabulate the desired information.

The following are the data totals indicated by the answered questionnaires.

Furnaces all kinds—manufactured in—

1915—187,280
1916—229,785
1917—276,232

Information was also furnished as to amounts used of pig-iron, steel, coke, coal and electricity. Also number of moulders, salesmen and other employees.

In the spring of 1918 President Richardson had received a call from the United States Government to serve in Washington as one of its "$-a-year-men" and he promptly accepted. Finally his work in Washington made it necessary for him to retire from the presidency of the Association.

W. G. Wise of Akron, Ohio, a charter member and at that time vice president of the Association, was unanimously elected president to succeed Mr. Richardson.

While war conditions during 1917 and 1918 were requiring much of the time and attention of the Association, its other activities were by no means neglected.

Building codes were studied and plans made to improve them by formulating and recommending a code regulating the installation of warm-air heaters which could be incorporated in a city building code.

The distribution of erroneous information relative to furnace heating was both prevented and corrected.

The great research program in cooperation with the University of Illinois was established.

A list of 18,000 furnace dealers in the United States was compiled.

The practice of the consignment of furnaces to customers was condemned.

Educational institutions were encouraged to establish courses in warm-air heating.

A standard furnace installation contract form was adopted and innumerable other large and small services rendered to the Association's members and the industry in general as well as to the public.

By 1917 the pipeless furnace for which extravagant claims were sometimes made, had increased in sale to a very marked degree and received "official" attention in January, 1917, when the Association in convention adopted the following Resolution:

"WHEREAS, The manufacture and sale of the so-called pipeless furnace has increased and its possibilities as a central heating plant are liable to be misunderstood,

"Therefore be it Resolved:

"1. that, The National Warm Air Heating and Ventilating Association recommend to manufacturers the avoidance of all extravagant and unwarranted claims in reference to the pipeless furnace;

"2. that, it is not a warm-air furnace in the fullest sense;

"3. that, in the best interests of the industry dealers are urged to advise prospective customers of its true limitations as a heater.

"4. that, prospective purchasers of warm-air

War-Busy Industry Needs Your Help

in solving tough ventilating problems

● You have an unusual selection of Roof Ventilators in Swartwout's ***Steel*** and ***Non-critical Materials*** Lines. Write for catalogs and advice on what types to recommend to your customers.

Swartwout
Roof Ventilators

Swartwout Multiple Heat Valve
Swartwout-Dexter Heat Valve
Swartwout Air Valve • Swartwout Rotary
Swartwout Airjector

THE SWARTWOUT COMPANY
18511 Euclid Avenue • Cleveland, Ohio

WHITNEY LEVER PUNCHES

No. 4B PUNCH

Length 8½ inches. Capacity ⅛-inch through 16 gauge. Deep Throat—2 inches. Weight—8 pounds. Punches and Dies—¼" to ⅝" by 64ths.

No. 6 PUNCH

Length—26½ inches. Capacity — ¼-inch hole through ⅜-inch iron; especially adapted for button punching or tamplet work. Punches and dies ¼" to ⅝" by 32nds

No. 91 PUNCH

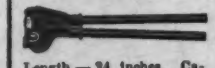
CAPACITY

½-inch hole through ¼-inch iron; ⅝-inch hole through ⅜-inch iron; 2-inch hole through ⅛-inch iron. Depth throat, 5 inches. Weight, 82 lbs.

We have tools for every purpose needed by Sheet Metal Contractors.

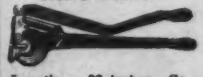
Ask your Jobber.

No. 1 PUNCH



Length — 24 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes from ⅛ to ⅜ by 64ths.

No. 2 PUNCH



Length — 23 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes ⅜-inch to ½-inch by 64ths.

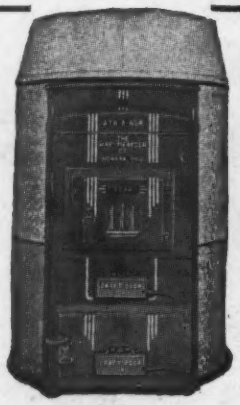
CHANNEL IRON PUNCH

Companion to No. 2 Punch. Every part of the two Punches Interchangeable, including punches and dies. Capacity—¼-inch hole through ¼-inch iron.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

ATH-A-NOR

FURNACE REPAIR PARTS



COMBINE QUALITY EFFICIENCY

Ath-A-Nor Furnaces manufactured by the May-Fiebeger Company for the past 50 years have proved their ability as economical and efficient heating plants in thousands of homes throughout the country.

In these days of conservation, you should check all furnaces. Replace all parts that impair efficiency, and make certain that they operate perfectly. When ordering repair parts for Ath-A-Nor furnaces order them from May-Fiebeger. They will operate as efficiently as the original parts and assure longest wear. Remember . . . Ath-A-Nor Furnaces for the "MUST" replacements . . . and Ath-A-Nor Repair Parts for easiest installation and highest efficiency.

MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS

MAY-FIEBEGER COMPANY

NEWARK OHIO

furnaces are advised to be fully satisfied as to whether or not the heater is adapted for the use intended, before contracting for same."

This resolution was regarded as a fair statement of the facts and probably helped materially to protect the public and the industry until the limitations of the pipeless furnace became common knowledge.

It was also during these same war years that the Association's progress and possibilities began to be recognized by such leaders and authorities in heating as Doctor E. Vernon Hill, Professor J. D. Hoffman, Dean John R. Allen, and many others who encouraged and complimented the organization upon its program and accomplishments.

Professor Hoffman, Dean of the College of Engineering, Purdue University, Lafayette, Indiana, was particularly helpful and until the time of his death was active in the Association's affairs giving generously of his time, knowledge and talents to furnace heating and to the formation of the Installation Codes.

◆

Check Chimney Draft

(*Continued from page* 45)

If the draft gauge reading over the fire does not show these drafts when the fire is burning briskly, then the chimney is at fault and should be remedied.

Reasons for poor chimney draft have been presented many times, but briefly are—

Chimney is too low, chimney is obstructed from certain directions by adjoining buildings or trees, there are leaks in the flue, flue is obstructed, the flue is under size.

★ CUT ANY SHAPE ★ CUT ANY SIZE SHEET ★ SIZES FROM 18 GAUGE TO ½".

MARSHALLTOWN THROATLESS SHEARS

Here's just the Shear that offers every feature you want. It does hundreds of odd shearing jobs better and faster—yet is an inexpensive hand operated tool. Send at once for Shear Bulletin. It gives all details of the Marshalltown line of sizes from 18 gauge to ½ inch capacity.

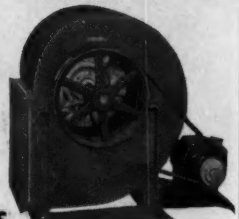
MARSHALLTOWN MFG. COMPANY

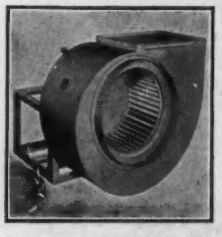
920 Nevada Street, Marshalltown, Iowa

YOUR BLOWER Requirements

AVAILABLE AT

Schwitzer-Cummins Company





★ **BLOWERS FOR EVERY PURPOSE**

Double Inlet and Single Inlet

HY-DUTY Blowers, 9¾" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical Discharge • Top and Bottom Motor Mounting • Dual Units also available.

★ **CENTER DISC WHEEL**—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".

★ **ENGINEERING DATA**—Write for Catalogues showing complete Performance Data • Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION

SCHWITZER-CUMMINS COMPANY

1145 EAST 22ND STREET INDIANAPOLIS, U. S. A.

If the draft gauge shows insufficient draft for combustion at the proper rate, then a quick check can be made of the chimney and smoke pipe to determine what is wrong. Certain customary checks are as follows—

1—The proper chimney height required and the proper flue size can be compared with the furnace size by using the two tables which accompany.

2—Poke the smoke pipe with an ice pick to see if there are holes or rusted out metal.

3—Check the ash pit draft door and firing door to see if these doors fit tightly.

4—Is there a water heater or a fireplace vented into the furnace flue? If so, blocking these off may gain the necessary draft.

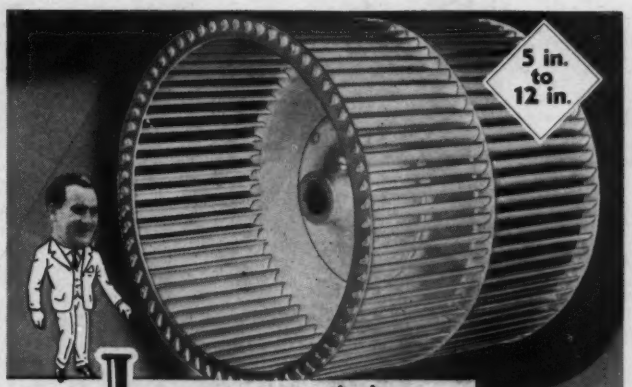
5—Inspect chimney mortar joints with a lighted candle; if the flame is sucked into the flue or chimney with a fire in the furnace, the chimney leaks.

6—Insert a hand mirror at the base of the chimney through the clean-out door and see if you can see the sky.

7—Does the smoke pipe thimble project into the flue; if so, cut it off flush with the flue surface.

8—Always check to see that there is sufficient air for combustion; a too tight basement will not provide sufficient air for cumbustion.

Lastly, a part of any furnace cleaning procedure should be a check of all furnace joints.



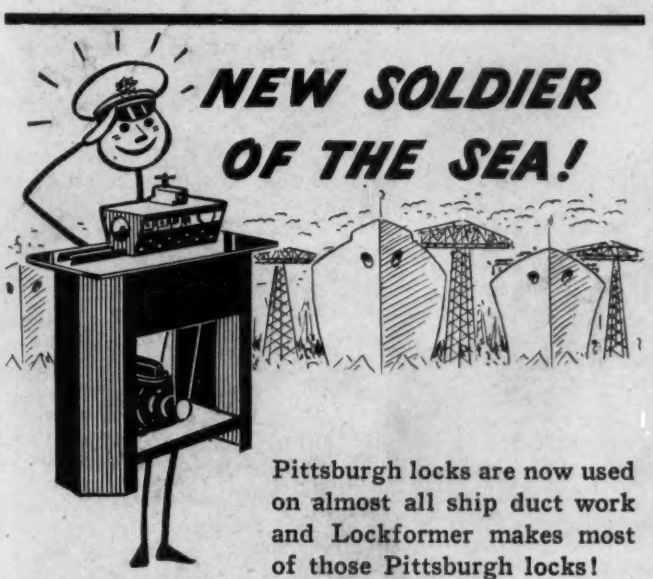
Janette
Blower Wheels

Janette wheels embody a patented design, which enables them to stand exceptionally hard service. For over 18 years, these wheels have given reliable service to manufacturers, whose names are the "WHO'S WHO" of the stoker, oil burner, ventilating, generator, supercharger and air cooled gasoline engine industries.

Janette wheels are rugged, quiet in operation and deliver their maximum volumes of air with a minimum of air noise and power consumption.

You too, would be pleased with their performance.

Janette Manufacturing Company
556-558 W. Monroe St. Chicago, Ill.



NEW SOLDIER OF THE SEA!

Pittsburgh locks are now used on almost all ship duct work and Lockformer makes most of those Pittsburgh locks!

Because Lockformer gives speed, speed and more speed—with resultant great saving of man power.

Write for catalog showing complete Lockformer line

The LOCKFORMER Co.
4617 ARTHINGTON STREET, CHICAGO, ILLINOIS

SHEARS

CIRCLES! CURVES! ODD SHAPES!

Whichever you want, a straight cut or irregular curve—it's as easy on the inside as the outside, on either flat sheets or formed work. No starting holes needed for an inside cut. A Libert is easy to operate—foot pedal control allows use of both hands to guide work at all times. It shears cleanly! Edges are *smooth;* need no further finishing. *Write for Bulletin.*

Made in sizes up to 60-in. throat, 10-gauge capacity

2-Q-43

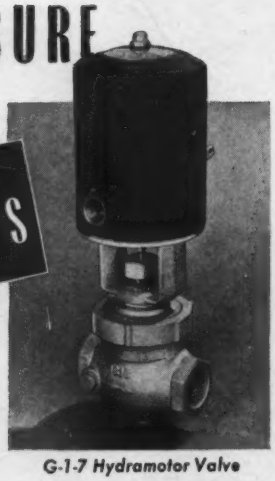
CIRCLE CUTTING ATTACHMENT Included as Standard Equipment With This Machine

Libert Hi-Speed SHEAR

LIBERT MACHINE COMPANY
GREEN BAY, WISCONSIN

HIGH PRESSURE

G-1 SERIES



G-1-7 Hydramotor Valve

TWO-WAY
CURRENT FAILURE VALVES

General Controls G-1 Series Valves are two-way current failure *Hydramotor Valves designed for operating pressures up to 300 lbs. G-1 Valves are suitable for gas, oil, water, air and steam. Approximate opening time 8-10 seconds; closing—2 seconds. Operator dimension only 4¼", diameter 6" high, weight approximately 7½ lbs. Write for Catalog 52.

*Trademark registered United States Patent Office.

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801 ALLEN AVENUE • GLENDALE 1, CALIFORNIA
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PERFORATED METALS ARE ESSENTIAL

They are used in the processing of grain, food, chemicals, ore, coal, rubber, petroleum and many other products.

Our range of sizes is great and we aim to meet the most exacting demands.

Write us for information.

The Harrington & King PERFORATING Co.

5649 Fillmore St., Chicago 44, Ill. and 114 Liberty St., New York 6, N. Y.

Monthly Profit And Loss Statement

(*Continued from page* 35)

For example, if you had a loss carry-over of $2,400 in 1941, of which only $600 was absorbed in 1942, leaving $1,800 to carry over to 1943, then it is up to you in 1943 to see that net profit is at least $1,800. Whether you make it or not, you should work toward that objective. If it runs less, the unabsorbed portion cannot be carried over to the third year and you lose credit for the difference. This shows clearly that you can't forget your income tax throughout the year, that it is now so closely entwined with operations that you must consider it an element of operating routine month-to-month.

Liquidity of Spendable Profit

Even if the dealer or contractor has a satisfactory portion left after deduction of income taxes, he may not have the funds to pay unless he increases his working capital by cutting expenses, discounting his bills, collecting his accounts more promptly or going on a strictly cash basis on repairs and service. If his variable expenses are high compared to fixed expenses, he may be able to reduce overhead somewhat. Expense control is of utmost importance today, not only to assure profitable operation but to provide the liquid funds to keep business moving without borrowing and paying interest, thereby increasing expense.

By and large, however, the accounts receivable offer the best opportunity to improve the cash position. When the tax was low, the contractor or dealer may have been able to let collections run longer than wise practice conceded desirable because he had ample funds, unharried by a high tax lien, or his suppliers carried him for a time. But today his suppliers will face the same problem of meeting a high tax bill promptly and must therefore get their collection in faster than before so that the dealer or contractor must put the pressure on his credit customers too.

The income tax will be high for years to come and will compel the business man to revise his working capital ratios in order to have sufficient liquid funds to pay Uncle Sam on the nose. The net profit on the profit and loss statement does not indicate the liquid funds available to meet obligations. We have found cases where the net was substantial, but the working capital way below par. In normal times, a dealer's working capital was considered satisfactory when the current ratio was 2 to 1. Now it should be 3 to 1, at least. The ratio of current assets to current liabilities is called the current ratio.

Credit men and commercial authorities are already giving consideration to the changing yardsticks brought about by high taxes and other wartime restrictions and are revising their methods of business analysis. In the future, when granting credit, the credit man will consider the tax that will be paid on business operations, not only around March 15, but throughout the year, pro-rating the expense per month, a factor that did not inject itself into credit analysis before.

Inasmuch as business specialists are already considering the changes that high taxes will superimpose on operating ratios and routine, the warm air heating dealer or sheet metal contractor should also get in line now because the trend will gain momentum fast

and he will benefit by early compliance with the change. When granting credit to individuals or business concerns in the future, consider the fact that the higher tax that must be paid on income may make a credit-seeker less desirable a risk than heretofore.

The going will be tougher with the months, yet, the dealer or contractor who merchandises intelligently, revamps his organization to cope with the new problems confronting him, and analyzes his profit and loss statement monthly to see that he earns a profit on sales and keeps his cash position in good shape, can come through 1943 and the remainder of the duration with a better-than-expected smile.

◆

Fuel Conservation

(*Continued from page* 25)

tomer a service including all the checks listed in this month's section then you have a real service to sell. Not a $2.50 cleaning job, but a service which is worth ten, fifteen, twenty or more dollars.

Lastly, we again point out that this effort is a definite contribution to the war effort and every dealer should be anxious to cooperate.

◆

Herman Staiger of Staiger Hardware Co., 613 Franklin Street, Michigan City, Indiana, died June 17—funeral June 21 at Michigan City.

Herman and his brother George were the owners of one of the oldest hardware, plumbing and heating shops in Indiana. Herman retired in 1938. Two sons of Herman Staiger—Harry and William—will continue the business.

for Safety with VITROLINER

"the superior Chimney Liner"

Vitroliner Lining in a masonry chimney gives positive protection against FIRE—and CONDENSATION. The draft is automatically increased. Old chimneys are given a new lease on life.

Vitroliner is manufactured of finest materials obtainable. It consists of lengths of acid-resisting vitreous enameled steel pipe and fittings.

CONTRACTORS: Vitroliner can be a profitable business for You. Installation is easy. A complete simplified instruction sheet and further information will gladly be sent you on request. No obligation.

CONDENSATION ENGINEERING CORPORATION

2515 Archer Ave. Chicago, Ill.

$2.00 Saves Hundreds!

MILLIONS of Home Owners are waiting to have their Gravity and Air Conditioning Registers STREEKNOTIZED—Cost only $2.00 per register to the home owner, easy to sell, easy to install.

Show your customers how STREEKNOTIZED Registers save hundreds of dollars in decorating costs and You Make Big Profits, Too! A twelve month a year proposition! Get details from your jobber.

These STREEKNO Jobbers Will Supply You!

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Huron Pip & Supply Co., Port Huron, Mich.
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Marshall-Wells Co., Portland, Ore.
Marshall-Wells Co., Seattle, Wash.
Metal Service Co., Green Bay, Wis.
Milwauke Stove & Furnace Repair Co., Milwaukee, Wis.
Morley-Murphy Co., Green Bay, Wis.
Mott Brothers Co., Rockford, Ill.
Nemec Heating Supply Co., A. A., Indianapolis, Ind.
Northwestern Stove Repair Co., Chicago, Ill.
Omaha Stove Repair Works, Omaha, Neb.
Osborn Co., J. M. & L. A., Cleveland, Ohio
Reggins Metal Products Co., Kankakee, Ill.
Republic Metals, Inc., Chicago, Ill.
Schwab Furnace Co., Milwaukee, Wis.
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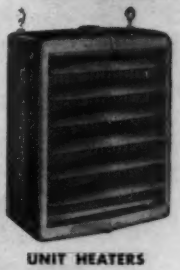
Warm Air Heating Supply Co., Detroit, Mich.

EXCEL HEATING & AIR CONDITIONING CO.

3715-19 Belmont Ave., Chicago 18, Ill.

"We Do a Nice Volume Now—Thanks to CLARAGE EQUIPMENT"

War plants, army barracks and other vital war-time buildings need heating and ventilating, or exhaust and blow pipe installations. This high priority business can be your salvation. Specify Clarage Fans, Blowers, Unit Heaters! Nationally known and Nationally accepted, these highest quality air-handling products help you land the desirable jobs. **Write today for descriptive literature.**



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EXHAUST FANS

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COMPLETE AIR CONDITIONING • COOLING • VENTILATION • FACTORY HEATING • MECHANICAL DRAFT • FANS and BLOWERS for INDUSTRIAL NEEDS

Clarage Fan Company Kalamazoo, Mich.

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SPOT WELD
WITH AN
ACME "Hot Spot"
WELDER

Proven utility for over 26 years in thousands of sheet metal fabricating plants.

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HEATING UNITS

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Distributors of All Heating and Air Conditioning Equipment
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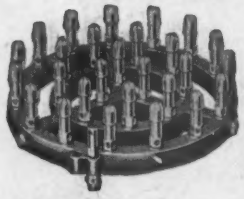
BARBER BURNERS
For ALL Gas Appliances



Our facilities are now mainly employed on war work. For those limited purposes for which our regular line of products is permitted, we shall continue to supply them. Later, when normal conditions are restored, Barber will furnish its customary service to the trade on high quality Burners and Regulators.

Latest Catalog on request.

THE BARBER GAS BURNER CO.
3704 Superior Ave., Cleveland, Ohio

CHENEY METAL
The Modern SHEET METAL

- SUPERIOR TO GALVANIZED IRON
- WEATHER PROOF
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- FORMS EASILY WITH REGULAR SHOP TOOLS

CHENEY METAL PRODUCTS CO. TRENTON, N.J.

WRITE FOR DESCRIPTIVE FOLDER AND THE NAME OF YOUR NEAREST DISTRIBUTOR

OPA—RPS 49

Sheet Price Ceiling

(*Continued from page* 34)

"In Zone 5 shipments necessitating freight absorption of more than $0.30 per 100 pounds (using rail rates) are considered as being beyond a seller's normal market area," said OPA. "When a truck shipment is made, by a seller located within Zone 5, beyond his normal market area, he is permitted to use transportation charges actually paid from the shipping point to destination, less a deduction of $0.40 per 100 pounds. The $0.10 per 100 pounds additional deduction is designed to deter the use of truck where the needs of the seller require only rail shipment. To permit the seller to use the full amount of transportation charges actually paid would, in the opinion of OPA, cause an unjustifiable increase in shipment by truck where such shipment is not needed. This would be the tendency if the additional absorption were not required, because warehousemen find it more convenient and less costly to load the trucks instead of railroad cars, or to truck the material to the nearest railroad freight station. At the same time, however, it does not penalize sellers compelled by the exigencies of the War effort to use truck and pay the higher truck rates.

"Within Zones 7, 8, 9 and 10, in calculating the freight charge the seller is required to equalize freight against one or more warehouse centers specifically listed for each zone. He first determines the carload freight from the governing basing point to the governing warehouse center for the zone. In Zone 7, the governing warehouse center is St. Paul; in Zone 8, it is St. Louis; in Zone 9, Omaha; and in Zone 10, Denver. He then equalizes with either the governing warehouse center, or other warehouse centers specifically named, by adding less-than-carload freight to the customer's destination from whichever center gives the lowest figure. The other specified warehouse centers are Duluth in Zone 7, and Pueblo and Colorado Springs in Zone 10. In Zones 8 and 9, there are no centers other than the governing warehouse center to be used in computing the freight charge.

Calculating Carload Ceiling Prices

"On mixed carload shipments of 40,000 pounds or more, the 500 pound quantity price, from which the seller deducts $7 per net ton, is to be determined in accordance with the zone system, but is to be based upon carload freight rather than less-than-carload freight wherever freight is a factor. On straight carloads, the previous provisions govern, that is, the mill price, as established by Revised Price Schedule No. 6, or the price set by OPA after War Production Board's certification," OPA concluded.

General Provisions

The general provisions containing definitions of computing the zone destination price, zone shipping point price and the governing basing point, and the method of determining maximum prices for shipments from one zone to another, or from a zone into a non-zoned area, or from the non-zoned area into a zone, are in Amendments Nos. 14 and 15. In order that Amendment No. 16 may be used without separate reference to the general provisions of the regulation as amended by Amendments 14 and 15, they are reprinted in full at the end of the summary.

Kruckman—The Fuel Situation

(*Continued from page* 33)

in them and what they are doing that already is reflected in an enthusiasm and vivid loyalty that is unique in the present war government.

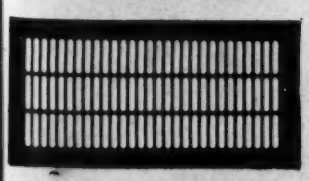
It must be easy to understand there are now few employees in WPB who would not "go to hell" for Nelson. By this extraordinary action Nelson has solidified the thousands of WPB workers into an active phalanx of goodwill that will have a profound influence on the members of Congress, and others, if and when a concerted effort is made to crowd him out of his place. Nelson is a friendly person with great magnetism. It is possible the idea may have been solely his own. It is assumed, however, that A. C. Whiteside, head of the OCR, may have had something to do with it. Whiteside also is a good salesman. He has sold OCR to the Capital with amazing effectiveness.

There is now an impression here that OCR is a practical and realistic agency unreservedly devoted to the interest of the civilian in any way consistent with the fighting of the war. Quietly but efficiently, he appears to have pitted himself against the Army and Navy and other non-civilian agencies when their demands seemed unreasonable. OCR is credited with much of the steel and iron and other metals now quietly flowing into some civilian industries for the things needed by civilians.

Whiteside already is said to have gotten rid of 1/3 of the personnel held over from the Weiner regime. These people, like many still in OPA, are the original ultra liberals who came into Government with Henderson and other New Dealers. They belong to the academic group Washington calls "the Professors." They are notable for plans and formulas, but they usually lack the initiative to put them into operation. Whiteside has the energy and courage to ease them out, while Prentiss Brown allowed them to stay in OPA, which is still muscle-bound. Whiteside is credited with the purpose to get rid of at least ½ the personnel he found in OCR.

Under Whiteside, it is obvious the civilian right to fuel may be brought to a focus under an interdepartmental committee composed of representatives of all agencies having a finger in the pie. The committee is in process of being shaped.

War Products Come First!



Auer is now engaged principally on vital aircraft parts and other war-time products. We are still able to furnish most styles of registers from inventory stocks, for all purposes permitted by Federal regulations. We are also well equipped for sub-contracts on metal stamping and fabricating, in gauges 10 to 24, and invite your inquiry on priority war goods.

Auer Register Book sent on request.

THE AUER REGISTER COMPANY, Cleveland, O.

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& GRILLES · For Air Conditioning *and* Gravity

Elgo Ventilating Specialties

Weather-stripped Automatic Shutter

Completely weather-stripped around the inner edge of the frame, preventing the entrance of wind, rain, snow and insect pests. It's the tightest fitting shutter on the market. Exceptionally sensitive to air currents, yet entirely free from louver flutter.

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Free CATALOG

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6966 W. Jefferson Detroit, Mich.

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Cut Metal, Faster, Easier

Black and Decker's new, redesigned Portable Lectro-Shears cut all types of sheet metal quickly, accurately . . . on a radius as small as ¾". Cutting operation always visible. New, improved operating handles provide better balance, easier control on curves and irregular lines. Cut up to rated capacity in steel, galvanized iron . . . 50% greater in non-ferrous metals. Ball-bearing equipped. Universal motor, designed for high speed, trouble-free service. Two sizes—18 and 16 gauge. No. 16 handle equipped with instant release trigger switch and locking pin for continuous operation. See your Black and Decker Distributor, or write direct to: The Black & Decker Mfg. Co., 782 Penna. Ave., Towson, Md.

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"Alnor" Velometer fills the need for a simple, accurate means of determining air velocity in air conditioning, forced air exhaust ducts, etc. Peak efficiency operation is now more important than ever before . . . and Velometer with its many simple attachments assures correct readings, under the most adverse conditions, in feet per minute, right on the scale! These readings enable you to gauge the systems efficiency and MAKE NECESSARY ADJUSTMENTS to assure greatest efficiency. Write for new catalog now!

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NEEDS NO PRIORITY

FLOWS EASILY

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PORTABLE SHEARS

Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for literature showing complete line.

ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be obtained for shearing stainless steel

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This DENSEWOOD Mallet..

Takes Longer, Harder Service!

You save money, when you buy DENSEWOOD Mallets for all metal work. Made of "Condensed" wood, they're gaining rapid acceptance as a more efficient and economical tool. Non-splitting, resilient, they cannot "mush out", and have a minimum of bounce. They last longer under hard service, do more work, better. Exclusive handle construction prevents loosening at the head. Sizes and types available for all types of work.

Prove the money-saving advantages of DENSEWOOD on YOUR work. Write for details and prices.

DENSEWOOD CORPORATION

ELKHORN, WISCONSIN

On Our Industry's Front

(*Continued from page* 36)

cases where certain conditions existed prior to July 22, 1943, in the newly added territory.

The new states are Alabama, Mississippi, Louisiana, Arkansas, Texas and New Mexico in the South and Southwest, Idaho, Montana, Wyoming, Utah and Colorado in the Rocky Mountain area and Arizona, California and Nevada in the West.

2. The delivery of fuel oil for weed control purposes anywhere in the United States is prohibited.

3. Where new space heaters have been acquired under OPA Ration Order No. 9, the delivery of fuel oil is permitted.

All correspondence and appeals regarding the terms of the new Order should be addressed to the PAW District Director of Marketing for the area affected. These are:

1. For Western Florida—District No. 1, 1104 Chanin Building, 122 East 42nd Street, New York, New York.
2. For Alabama, Mississippi, Arkansas, New Mexico, Texas and Louisiana—District No. 3, 245 Mellie Esperson Building, Houston, Texas.
3. For the Rocky Mountain Area—District No. 4, 320 National Bank Building, Denver, Colorado.
4. For the West—District No. 5, 855 Subway Terminal Building, Los Angeles, California.

◆

PREFERENCE Rating Order P-100, dealing with maintenance, repair and operating supplies, has been completely revoked.

This Order previously was revoked as of April 2, except as to producers in Canada, to whom a serially numbered copy had been issued. Canadian companies are now eligible to apply through the Department of Munitions and Supply, Ottawa, Canada, to the War Production Board for authorization to use the procedures established under CMP Regulation No. 5 to obtain their necessary maintenance, repair and operating supplies.

As a result of this eligibility, WPB has revoked Preference Rating Order P-100 completely.

◆

Copper Recovery

TO increase the supply of copper and copper-base alloy materials urgently needed for war uses, the War Production Board has announced a revised program for the recovery of idle and excess inventories of such materials in the hands of building contractors and their suppliers.

Two types of materials are sought. One includes copper and copper-base alloy pipe fittings and tube fittings. The other includes copper and copper-base alloy building materials, including primary forms.

Among the materials listed in the second group are such items as store fronts, access panels, cornices, drip pans, weather stripping and insulation, railings, partitions, flashings and flashing valley lining, fences and gates, louvers and marquees, molding and trim, gutters, leaders, downspouts, ornamental metal work,

vents, window frames, sills and fittings, shower parts, strip for laying linoleum, roof ventilators and skylights.

Under the copper building material section of the program, the WPB will use its facilities to promote direct transactions between owners and prospective purchasers of primary material which can be used in the war effort in present form. In these transactions, of course, the seller will receive the full price paid by the purchaser.

Primary material which has no permitted use in its present form and fabricated copper and copper-base alloy building materials reported under the program may be needed for remelting for war use. For material which it purchases for remelting or reprocessing, the Government, through the Copper Recovery Corporation, will pay the above-scrap prices now in effect under the recovery program if the material is reported by July 31. If reported after that date, the material may be ordered sold as scrap.

◆

Rejecting Rated Orders

CIRCUMSTANCES under which a *seller* may reject rated purchase orders which do not meet his regularly established terms of sale have been clarified by the WPB.

Rated orders may be rejected for the following reasons:

1. Where a rated order calls for quantities which are less than the minimum which a person regularly sells. For example, a manufacturer who has been selling only in carload lots may reject a rated order for less than a carload lot.

2. Where a person regularly sells only to certain types of trade purchasers, such as wholesalers, jobbers, or retailers, he may reject orders from other types of purchasers, but only if the merchandise can be obtained in the required quantity through regular trade channels.

3. Where a manufacturer or wholesaler has an exclusive distributor, either for all sales or for a particular territory, he may reject rated orders from other purchasers, provided the exclusive distributor is in a position to fill the orders promptly.

These provisions, which are contained in Interpretation 3 to Priorities Regulation, clarify exceptions to the rule that a vendor must sell his product to any person who presents him with a rated order.

◆

MRO Records

RECORDS of maintenance repair and operating supplies may be kept on the basis of supplies *received*, rather than the amounts *ordered* in any quarter, the War Production Board announces.

Although quantity restrictions under CMP Regulation No. 5 are on an "order" basis, if a person prefers to compute his expenditures on a "receipt" basis, he may do so, according to Direction 8. However, the use of one method for part of the supplies and another method for the rest is not permissible.

CHICAGO STEEL BRAKE

BEST BY FORTY-TWO YEARS TEST

DREIS & KRUMP MFG. CO.
7404 LOOMIS BLVD. CHICAGO

WISS "METAL MASTER"

Compound Action
AVIATION SNIPS
Used extensively by leading aviation and metal working industries, and in U. S. Government Plants throughout the country.

- Cuts circles, squares and irregular patterns on Stainless, Dural, and Monel Metals with ease.
- All Parts interchangeable.
- M1 for cutting left—M2 for cutting right.

WISS BULLDOG AND STANDARD PATTERN SNIPS are used in Shipyards, on Government construction projects, and on maintenance work wherever sheet metal is required.
Send for literature of complete line
J. WISS & SONS CO.
ESTABLISHED 1848 NEWARK, N. J.

Std. Arr. No. 1 for Belt Drive

New and improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

Write us about your problems. Send for Bulletin No. EX-41
BAYLEY BLOWER COMPANY
1817 South 66th Street Milwaukee, Wis.

NEW **BADGER** DAMPER REGULATOR *Control*

Time-Saver on Heating Installations . . .
You don't need to bother with hole drilling, bolts or rivets, when you install the new BADGER Damper Regulator Control. With this new idea in installation technique, all you need is a prick punch and a hammer. Then a few sharp blows of the hammer makes a snug-fitting, secure and solid fitting—with the punched metal itself forming the lock. It's so simple that apprentice labor can do the job at a substantial saving in time, labor, and money.
Buy BADGER through your favorite Jobber, or write direct for details and samples.

BADGER MFG. & SALES COMPANY
329 East Brown Street ◆ Milwaukee, Wisconsin
Mfr. of BADGER Humidifiers with the famous TWO-WAY Snap-Action Valve

Leader
KOOLSTACK FURNACES
FOR STOKERS
OIL or HANDFIRED
50,000 to 200,000 BTU's
Patented Damper Uses All the Heat in the Added Heating Surface
THAT
IS SOMETHING TO SELL
LEADER IRON WORKS, Inc.
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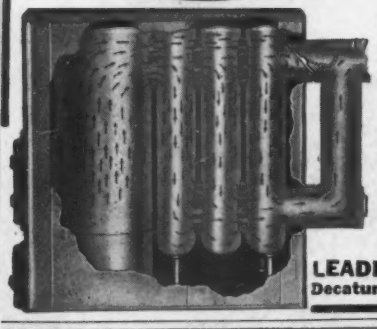

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FURNACES and WATER HEATERS
GILCO
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the "Stronghearted"
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ECON-O-COL Automatic COAL BURNER
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THE SHIELD OF QUALITY

IN 194- ?
When the strife is ended and you dealers can again present to prospective buyers a line of furnaces that will deliver any desired heat most efficiently and economically, and last indefinitely . . . Remember the Vernois line—of "Hell on Earth" tested furnaces . . . they have proved their ability as reliable warm air heating plants for the past 22 years . . . and will do so again in 194-?
MT. VERNON FURNACE & MFG. CO.
Vernois
• MT. VERNON
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☆ WAR TIME

W. B. Nixon, managing editor of **The American Rolling Mill Company's** *Ingot Iron Shop News,* was called to the Army in June. With his leaving the paper will be discontinued for the duration of the war. Publication will be resumed when peace comes.

Mr. Nixon was editor of another of ARMCO's merchandising papers for six years and wrote advertisements for the sheet metal trade magazines. He became Managing Editor of the *Shop News* last year when **Win Arnold,** former managing editor, went on duty as an Ensign in the Naval Reserve.

Carrier Corporation, Syracuse, N. Y., reports 384 of their salesmen, engineers and executives have already entered the Army, Navy, Marine or Government Service.

Seventy-five former employees are in battle areas.

One hundred per cent of present business consists of war orders—thirty per cent of which is not classified as air conditioning, refrigeration or heating.

Eighty-five per cent of their personnel are participating in salary allotment for war bonds—7.7 per cent total payroll is buying war bonds.—*W. A. Bowe, Adv. & Public Rel. Mgr.*

The York Corporation, York, Pa., formerly The York Ice Machinery Corporation, one of the early pioneers in industrial and commercial refrigeration and air conditioning, is now devoting its entire production of this equipment to the war effort, with the exception of a small percentage of repair parts for the maintenance of essential civilian installations, President Lauer said. Eighty-two per cent of the orders booked during the first half of the company's fiscal year were for mechanical cooling. The remaining 18 per cent comprised war material for marine, ordnance and other products extraneous to mechanical cooling.

Handy & Harman, 82 Fulton St., New York City 7, reports 168 of their employees, from all branches of their business are in every part of the armed forces and spread all over the world.

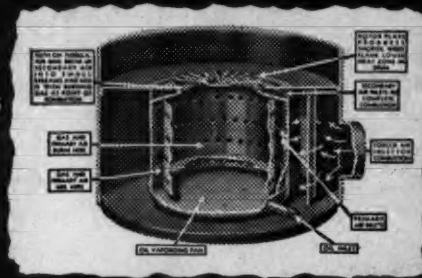
The company has had word from former employees in India, Africa, South Pacific and the Aleutians.

The company is producing silver anodes for plating airplane bearings; silver brazing alloys for joining metals in building ships, tanks, guns, airplanes and shells, as well as other essential equipment. Silver also is going in large quantities into electrical contacts and as clad metal is used in making essential equipment for the process industries.

More than three-quarters of the company's production now goes into war production. Production is at an all-time high even though products all contain precious metals. There are no new men in place of those who have gone into service.

Handy & Harman have been awarded the Army-Navy "E" pennant for producing silver products for war purposes and also a "Star" for continued achievement in this connection.—**F. T. Van Syckell, Adv. Mgr.**

Famous Patented Monogram Vaporizing Burn
Provides Highest Known Operating Efficiency with Oi
Full Forced Winter Air Conditioners
Booster Gravity Units
Utility Room Units
Automati Water Heaters
The QUINCY STOVE MFG. COMPANY, Quincy, Illinoi



TRADE NEWS ☆

J. V. Patten Company, Sycamore, Illinois, is approximately 100 per cent war orders—aircraft parts and 15,000,000 thirty-caliber armor piercing bullet projectiles.

Seventeen of their former employees are now in service of the USA—three in the Navy, one in the Waves and the balance in the Army.

H. E. Smith, Cary Manufacturing Company, Waupaca, Wisconsin, advises that they have converted their factory from the manufacturing of oil-burning furnaces and blower units to the manufacturing of defense materials which comprise various gasoline, stove and field range parts, and machine parts for submarine and diesel engines. They also manufactured 37 MM high explosive shells for eight months, completing the contract on these in March, 1943. Their list of machine parts is wide and varied. Present business consists of 97 per cent subcontracts for Army, Navy and Ordnance Department.

Employees are purchasing war bonds. Many have 10 per cent deducted from pay checks and several are having about twice that much deducted.

Vernon Wetherbee, son of the Cary general manager, is a gunner with the British Eighth Army. He arrived in Africa some time in July, 1942, at Cairo, Egypt, and went through the whole of the Tunisian campaign in North Africa, and has seen a good deal of action.

A quick description of today's **Gar Wood Industries, Inc.,** of Detroit, is to say that it is composed of six divisions, each manufacturing a wide variety of products and equipment now vitally useful in the winning of the war.

Included among the diversified Gar Wood products are gun mounts, barrage balloon winches, wire reels, troop and cargo bodies, mobile machine shop bodies, truck and trailer equipment such as dump bodies and hydraulic hoists, load-packers, winches, cranes, derricks, refueling tanks and water tanks—road machinery, including scrapers, bulldozers, roadbuilders, tamping rollers and rippers—heating equipment, and fast, powerful boats for the Navy and Army.

Many new high production welding and assembly fixtures have been designed and put into operation. The Tool Shop at Plant 4 designed a new multiple drilling machine for use in the manufacture of wooden cargo bodies. The machine was made almost wholly from scrap and obsolete service parts.

The Heating Division's Research Engineering Department designed and supervised the construction and installation of a 600- to 1,500-ton hydraulic press chiefly for the production of refueler tank parts and other heavy-formed, metal parts. This press, constructed of obsolete and excess sheets, structurals and plate material, increased production on some parts as much as 500 per cent over previous methods.

A machine operators' school was started on October 1, 1942, and accepts only untrained men with no previous experience.

Write for Catalog and Prices

SPEED UP ORDERS with a
BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. FASTER — Precision — accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

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THE ONLY 100% MERCURY SWITCH EQUIPPED CONTROL LINE

Hermetically sealed corrosion-proof Mercoid switches are approved by time and experience. They assure better performance and longer control life.

THE MERCOID CORPORATION
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REMEMBER — TO BUY GENUINE REPAIR PARTS for ROUND OAK — Furnaces Stoves and Ranges

ROUND OAK COMPANY
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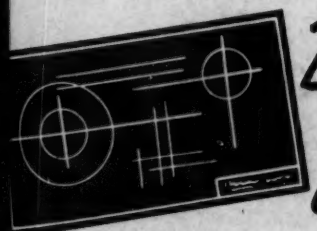


Blueprint for Peace

While our machinery spins to turn out the goods of war, our drafting rooms and experimental laboratories hum with activity on post-war heating and air-conditioning products. We'll be ready for the post-war period; you can depend on this.

CONCO Automatic PACKAGED HEAT

CONCO CORPORATION
Division of H. D. Conkey & Co., Mendota, Ill.

ACCURATE DEPENDABLE

MASTER HEAT REGULATOR

TYPE A-23 positive snap action regulator operates on a differential of only ½ degree.

WHITE MFG. CO., 2368 University Ave., St. Paul, Minn.

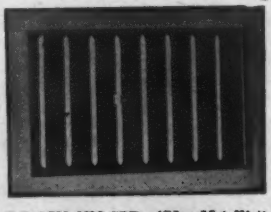
FURNACE REPAIR PARTS
For All Makes Now Available

With priorities restricting sales of new equipment, repair business is more essential than ever. Furnace dealers can still depend upon prompt deliveries of repair parts for ALL MAKES AND AGES of furnaces. Get the repair business now and you'll be all set to get the new jobs after the war. Send in your orders now, while stock is available for immediate delivery.

PEERLESS FOUNDRY CO.
1855 LUDLOW AVENUE INDIANAPOLIS, IND.
Pioneers in Warm Air Heating Equipment for over a third of a century.

Sturtevant
MILL EXHAUSTER
LARGE, STREAMLINED INLET MEANS MINIMUM LOSSES DUE TO ENTRANCE FRICTION OR EDDIES
FOR HIGH EFFICIENCY LOW POWER COSTS
B. F. STURTEVANT COMPANY
Hyde Park Boston, Mass.
Branches in Principal Cities
"Designed and Built by the Pioneer"

"NON-METALLIC" REGISTERS
FOR DEFENSE PROJECTS
Approved by Government Authorities for air-conditioning installations in Hospitals, Industrial Plants, Fortifications, etc., under Army, Navy or Maritime rulings. Field-tested STANDFORATED Register and Grille designs of durable, tempered Masonite are fabricated in standard sizes or to your specifications. Write for complete information.



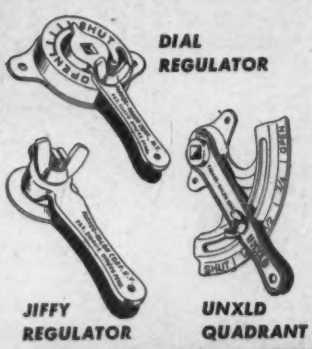
DESIGN NM-SLD—"Non-Metallic" Sliding Damper Foundation Vent.

STANDFORATED
FOR PRODUCTION SPEED-UP—
Specify Precision Processed STANDFORATED Perforations. Industrial Screens, Filters, Guards, etc., made to specifications for vital industries. Handy catalog sent on request.

STANDARD STAMPING & PERFORATING CO.
3137 W. 49th PLACE • CHICAGO, ILLINOIS

A Type And Size For Every Need

For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 190-192 Varick Street, New York.



PARKER-KALON damper controls

Interpretations, Amendments, Etc.

(*Continued from page* 31)

not been specifically revoked also may file on or before July 15 a CMP-H-1 application for controlled materials for the structures covered by the order.

In numerous cases, orders had been granted to builders who subsequently were unable to start actual construction because of financial difficulties or other factors. The new revocation procedure is intended to recover priorities from builders not in a position to produce the needed housing and to place those priorities in the hands of builders who qualify under these standards.

In a number of critical housing areas, priorities frozen in the hands of unproductive builders have prevented completion of the established war housing quotas.

Heating and sheet metal contractors holding orders assigned preference ratings some weeks old should ask the builder if he has filed a new application. If he hasn't your ratings are no good.

◆

Check Furnace Cleaning

(*Continued from page* 42)

for a heating season, the insulating effect of deposits of soot decreased the heat absorbed by the boilers two to seven per cent of the heat made available by the fuel, depending upon the thickness of the soot deposit.

"(2)—the losses expressed as a percentage of the coal burned will be less and will be approximately proportional to the overall efficiency Thus with 60 per cent efficiency, about 1¼ to 4¼ per cent of the coal will be wasted because of the insulating effect of the soot.

"(5)—These values do not include the waste of fuel that will result from incomplete combustion due to insufficient draft caused by the soot clogging the passages of the radiator or flue. These values usually will be much greater than the loss caused by the insulating effect."

Stoker Fly Ash

Contractors should pay particular attention to soot accumulations in stoker-fired furnaces where, in the Research Residence investigations disclosed that during a typical heating season some of the furnace horizontal passages were covered with a layer of fly ash from three to four inches in depth. Such accumulation may have a much greater effect in reducing efficiencies than the relatively thin layers of soot referred to in the Bureau of Mines report. Soot and fly ash removal should be a regular part of the annual inspection of the furnace, particularly in those cases in which chimney draft is weak. (See discussion on chimney draft.)

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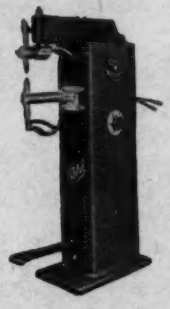

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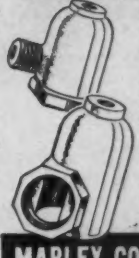

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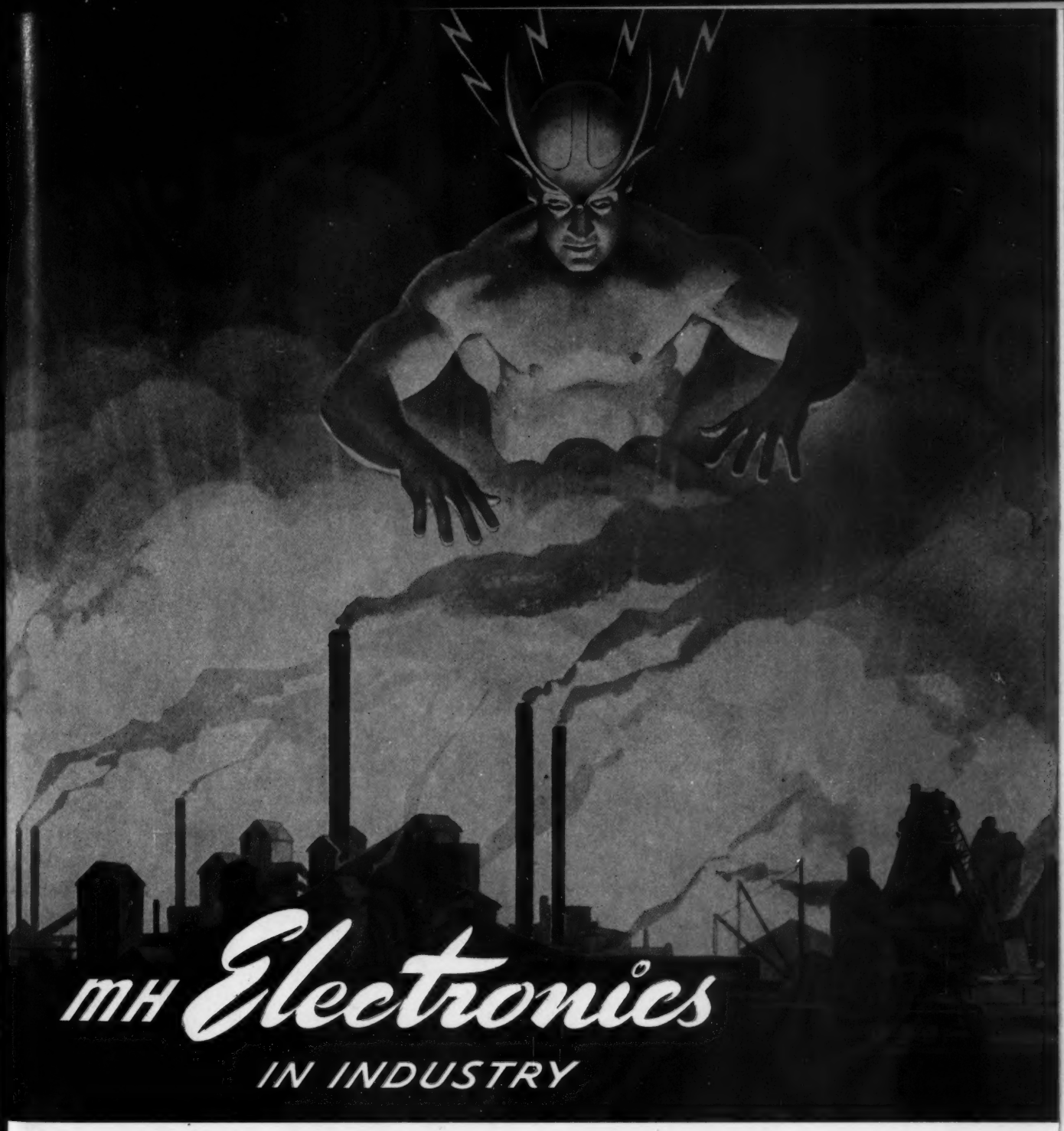

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